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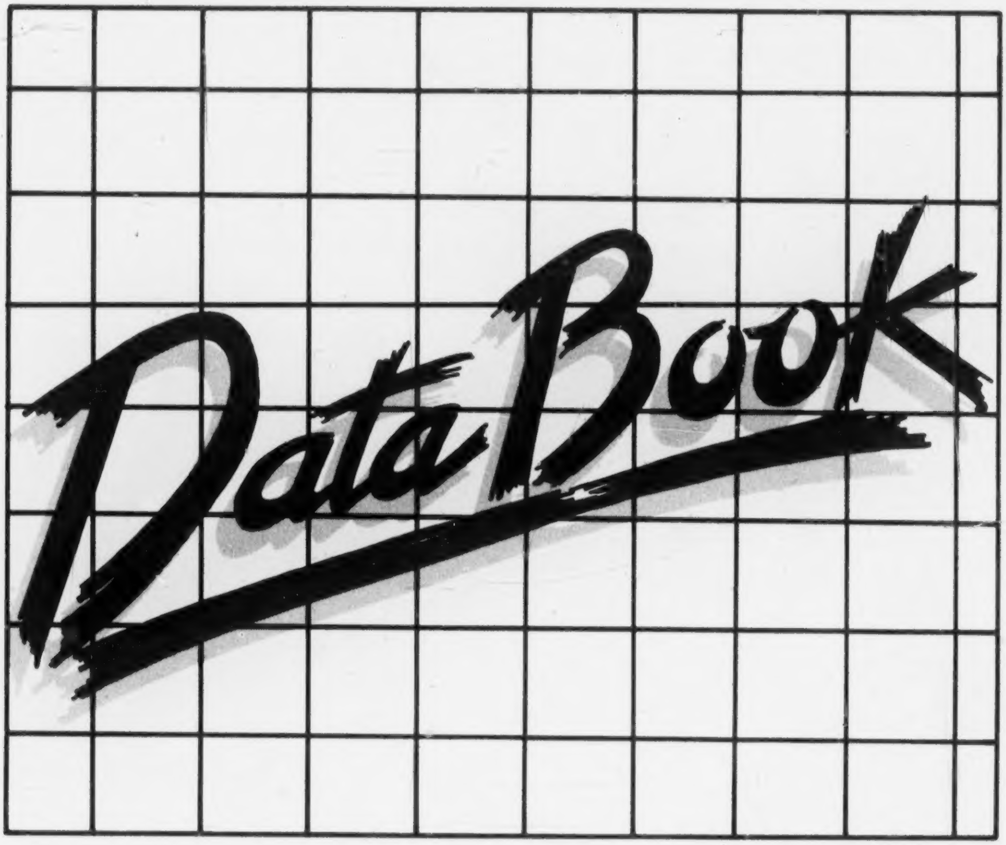
OIL & GAS JOURNAL



Data Book

1987 Edition

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Oil & Gas Journal DataBook

1987 Edition

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Foreword

The 1987 *OGJ DataBook* tells a story of a reverse price shock. It's already known as "The Crash of '86."

The seeds were sown during the price explosions of the '70s. These events triggered market forces that guaranteed the crash that followed. As industry analysts and planners know too well, no commodity can experience a tenfold increase in price without a violent reaction. And that reaction, postponed by production restraints, was finally sparked in December of 1985 when the Organization of Petroleum Exporting Countries (OPEC) decided to abandon its failing effort to defend prices and go for market share. It is a decision that even Saudi Arabia, the OPEC leader and architect of the strategy, would like to have back.

The *DataBook* traces, directly and indirectly, the shock wave as it rippled through almost every statistical series in this volume. OPEC managed to increase market share, but only by a meager 12%. And the cost of that gain was staggering: a price decline that reached 70% during the spring and summer and averaged approximately 50% for the year.

A badly disillusioned OPEC has abandoned the costly quest for market share and Saudi Arabia has sacked its architect, Shaikh Ahmed Zaki Yamani. As exporters chart a course for the future, their efforts will be guided by the experience of what life is like when oil sells for less than $10 a barrel.

As the *DataBook* logs in gruesome detail, the toll in lost revenues, investment, and jobs has been enormous. Capital investment, which historically tracks cash earnings and real prices closely, followed prices and profits downward. Investment in the U.S. industry fell to around $27 billion, down two-thirds from the 1981 peak of $83 billion. The drilling collapse was even steeper. Active rigs fell to 960, down 76% from the peak year and 52% for the year.

During 1982–86, more than 350,000 jobs were wiped out in the U.S. producing industry alone. Employment in the service sector at mid-1986 was off 55% from the peak, and companies supplying equipment and services had lost 73% of their capital.

Internationally, drilling fell 17% to approximately 1,075 rigs. That loss, though small by American standards, was nevertheless the largest year-to-year change in the international drilling rate in modern times. Industry witnessed the novelty of fewer drilling rigs operating in the U.S. than in the rest of the world outside North America. That relationship will probably persist for another year.

The worldwide market for petroleum equipment and services, which approached $150 billion at the peak, was scarcely half that level in 1986.

Operating companies and their suppliers have further restructured their businesses to adjust to the lower level of prices, activity, and investment. In light of continuing surplus capacity, further austerity lies ahead.

But that isn't all there is to the future. Just as the boom sowed the seeds of its own destruction, the collapse has set in motion forces that assure recovery. There is a positive side to the crash. Petroleum is ready to become a growth industry again.

On the demand side of the equation, growth is already under way. Lower prices pulled demand up about 2.5% in the non-Communist world in 1986 and 3% in the United States. For the first time in a decade, oil consumption grew faster than the economy.

Firmer demand brought a restructured refining industry close to conversion capacity, returning prosperity to an industry segment that went through its severe private recession ahead of upstream operators.

Lower prices mean that oil is competitive in the energy market again. The price of fuel oil dropped below natural gas in 1986, enabling oil to recapture some markets it lost during the past decade. Oil prices are also more affordable in importing developing countries, laying the basis for rising demand in the years ahead. The substitution surge may be over for the time being, but oil can expect to grow with the world economy, if at a slightly lower rate.

Based on a forecast by Oil & Gas Journal's Economics Department, world demand over the next five years will grow almost 10%, close to 6 million barrels per day, returning to the peak levels of 1979. Communist countries are likely to contribute about a million barrels per day of that growth.

That modest growth rate still assumes a major role for conservation. More efficient automobiles, buildings, and machinery are long-term fixtures of the economy. They are the main reason for the glut that brought the price collapse, and they won't go away quickly with a change in price. The long-term trend toward increased energy efficiency will continue in spite of lower prices, but the rate of gain will slow down. For example, the energy/GNP ratio declined 2.3% in 1986, and is expected to drop 1.1% in 1987. This will leave room for growth in demand for energy as a whole, oil included.

Demand for OPEC oil in particular will benefit from the effect of lower prices on supply. As the *DataBook* shows, month by month, U.S. production resumed its long-term and perhaps irreversible decline. Dragged down by the U.S., non-OPEC production over the next five years will likely experience a small decline. That will leave all of the non-Communist market growth—almost 5 million barrels per day—to members of OPEC.

The U.S. market will play a pivotal role.

Demand in the U.S. may rise only a million barrels per day in the next five years. But, because of declining production, requirements for imports will rise at least 2.5 million. If prices get stuck at $15, demand will grow even faster, and production will decline even more steeply. And the call on OPEC oil will rise about four million barrels per day. Thus, the gap between domestic demand and supply could approach nine million barrels per day in 1991, making the U.S. more than 50% dependent on imported oil and greatly increasing OPEC's leverage in world markets. At any level below $20, market forces within a few years will put upward pressure on prices, regardless of what OPEC does about production controls.

With only a moderate production restraint by OPEC, prices could rise gradually over the next five years. Without production restraint, prices will slip back toward $10 again, then rise more sharply later.

The American industry entered 1987 with a new tax structure that is less encouraging to investment in new reserves and facing economics similar to those in the decade of the '60s. In 1986, the rig count slipped even lower than the recession levels of the '60s, to the lowest point since drilling statistics have been compiled.

So drilling is due for a modest recovery, even if prices don't improve further. But lack of confidence in current price levels, whatever they happen to be, will discourage investment until operators and investors see some evidence of stability. Continued restructuring will also slow the rate of investment. So drilling recovery may be a year away.

At the end of 1985, analysts were still assessing the impact of the two great price shocks of the '70s. Contrary to assessments the year before, the impact was still working its way through the world economy. Analysts now are studying available data to get a better idea of the impact of the crash. Its effects will be felt for many years also.

The information in this *DataBook,* with that in the more extensive electronic library that constitutes the Oil & Gas Journal Energy Database, is offered to analysts as tools for shedding light on the present and future impact of these events on their business.

With this knowledge, businessmen may be able to reduce the uncertainty in what has become a very uncertain market. A year ago one industry study reached the conclusion that forecasting price, one of the most crucial elements in any business forecast, was an impossible task. Impossible or not, planners still must try.

In the case of oil, the difficulty is not hard to define. It is that price is not determined by economic forces alone. Over much of petroleum history, its price has been influenced if not determined by political factors. At different periods in history the regulator has been a single dominant company (Standard Oil Trust) or group of companies (the Seven Sisters), an influential government agency (Texas Railroad Commission) or a cartel of exporting nations (OPEC).

With surplus productive capacity of at least 8 million barrels per day, the current regulator is having trouble supporting prices at the new target level of $18. Because of this surplus, and the inability of OPEC to limit production to market demand, prices have been unstable at any level, from the officially established markers of $34, $29, and $28 a barrel, to the more recent floating levels in the market, following abandonment of official prices.

It is evident that for the foreseeable future, prices will reflect a mix of market and political factors. That should rule out levels of $10 a barrel or lower, which would prevail in a free market; or $28 a barrel, reflecting tight control of production, as sought by Iran, whose influence in OPEC is rising. The challenge for the planner is to give the proper weight to each factor. This requires a study of all available economic data, followed by an assessment of the probabilities for political restraint on the economic forces.

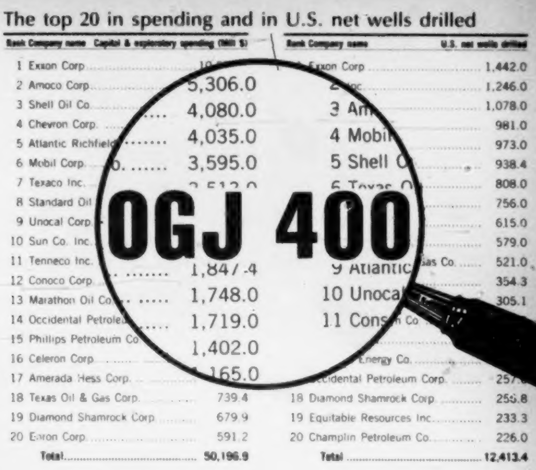
At yearend 1986, as OPEC struggled to regain control, market forces exerted the greater influence, indicating prices below the midpoint of this range. Under these conditions, next year's *DataBook* should show continuation of the demand growth trend chronicled in this volume.

Once before, in 1984, analysts thought the turnaround had come. But the 1986 *DataBook* showed how that recovery got sidetracked. Rather than a resumption of growth, 1984 turned out to be merely a pause in the recession. This time, on the basis of radically changed markets, the return to growth should be more than a temporary phenomenon.

Investment, particularly in exploration and production, will continue near the low levels of 1986 for perhaps another year. But recovery is in the wings, as augured by a further 2% increase in demand in 1987. Oil should hold onto markets recaptured when prices fell faster than competing fuels could react, and grow along with business activity.

This is how *Oil & Gas Journal* reads the data. This volume is compiled for the purpose of assisting other analysts in reaching their own conclusions tailored to their particular business needs.

Gene T. Kinney, Editor
Oil & Gas Journal



The top 20 in spending and in U.S. net wells drilled

Rank	Company name	Capital & exploratory spending (Mill $)
1	Exxon Corp	
2	Amoco Corp	
3	Shell Oil Co	
4	Chevron Corp	
5	Atlantic Richfield	
6	Mobil Corp	
7	Texaco Inc	
8	Standard Oil	
9	Unocal Corp	
10	Sun Co. Inc	
11	Tenneco Inc	
12	Conoco Corp	
13	Marathon Oil Co	
14	Occidental Petrole	
15	Phillips Petroleum Co	
16	Celeron Corp	
17	Amerada Hess Corp	
18	Texas Oil & Gas Corp	739.4
19	Diamond Shamrock Corp	679.9
20	Enron Corp	591.2
	Total	50,196.9

Rank	Company name	U.S. net wells drilled
	Exxon Corp	1,442.0
2	Inc	1,246.0
		1,078.0
		981.0
		973.0
		938.4
		808.0
		756.0
		615.0
		579.0
	Gas Co.	521.0
		354.3
		305.1
	Energy Co.	
	Occidental Petroleum Corp.	257
18	Diamond Shamrock Corp	256.8
19	Equitable Resources Inc	233.3
20	Champlin Petroleum Co.	226.0
	Total	12,413.4

Some key name changes from 1985 OGJ 400*

How company appeared on last year's list	Why change?	How company appears on this year's list
Adobe Oil & Gas	Merged into	Adobe Resources
Altex Oil	Name changed to	Altex Industries
Amarex	Merged into	Templeton Energy
American Natural Resources	Merged into	Coastal
Antares Oil	Merged into	Oxford Consolidated
Brooklyn Union Gas	Included under oil & gas subsid.	Fuel Resources
Dyco Petroleum	Merged into	Diversified Energies
Excel Energy	Merged into	Barrett Resources
Fluor Oil & Gas	Oil & gas assets bought by	Primary Fuels
Grayhill Exploration	Merged into	U.S. Minerals Exploration
Henderson Petroleum	Merged into	Burkhart Petroleum
Houston Natural Gas	Merged into	Enron
InterNorth	Name changed to	Enron
KN Energy	Spun-off subsid.	Plains Petroleum
Madison Resources	Merged into	Adobe Resources
Masters Energy	Merged into	Harken Oil & Gas
McCormick Oil & Gas	Name changed to	Graham-McCormick Oil & Gas
Monsanto Oil	Merged into	BHP Petroleum (Americas)
Montana-Dakota Utilities	Named changed to	MDU Resources Group
Oxford Exploration	Merged into	Oxford Consolidated
Reichhold Energy	Oil & Gas assets sold to	Atlantic Richfield
Sparkman Producing	Named changed to	Arch Petroleum
Transierra Exploration	Named changed to	Belcor
Trinity Oil & Gas	Named changed to	Questa Oil & Gas
United Energy Resources	Merged into	MidCon
Woods Petroleum	Merged into	Sunshine Mining

*Includes only companies with assets still identifiable on this year's OGJ 400. Some companies on last year's list don't appear because they are no longer public, are no longer in business, have no financial data available or can not be located.

OGJ

The top 20 in total revenue

Rank	Company name	Total revenue (Mill $)
1	Exxon Corp.	92,869.0
2	Mobil Corp.	60,609.0
3	Texaco Inc.	47,514.0
4	Chevron Corp.	45,325.0
5	Amoco Corp.	28,873.0
6	Atlantic Richfield Co.	23,080.0
7	Shell Oil Co.	20,477.0
8	Phillips Petroleum Co.	15,800.0
9	Occidental Petroleum Corp.	15,643.9
10	Tenneco Inc.	15,332.0
11	Sun Co. Inc.	15,076.0
12	Conoco Corp.	14,846.0
13	Standard Oil Co.	13,915.0
14	Unocal Corp.	11,641.0
15	Marathon Oil Co.	10,462.0
16	Enron Corp.	10,271.3
17	Ashland Oil Inc.	8,273.9
18	Amerada Hess Corp.	7,722.5
19	Coastal Corp.	7,310.7
20	Texas Eastern Corp.	5,489.2
	Total	**470,494.6**

20 fast growers*

Rank by total assets	Company	Stockholders' equity 1985	Stockholders' equity 1984	% change	Net income 1985	Net income 1984	% change	Long-term debt 1985	Long-term debt 1984
		$000	$000		$000	$000		$000	$000
140	Snyder Oil Partners	105,758	47,728	121.6	6,204	3,571	73.7	2,907	100
287	Cobb Resources Corp.	4,755	2,666	78.4	1,424	1,136	25.4	2,243	1,433
229	Brock Exploration Corp.	6,915	4,116	68.0	2,700	32	8337.5	5,745	10,253
358	Roseland Oil & Gas Co.	829	498	66.5	331	147	125.2	0	2
133	Allegheny & Western Energy Corp.	33,440	20,250	65.1	12,491	† 786	—	56,600	60,374
170	Beard Oil Co.	21,276	12,934	64.5	8,294	553	1399.8	26,228	30,929
199	Energy Oil Inc.	7,679	4,714	62.9	2,975	830	258.4	16,878	9,047
335	Southern Mineral Corp.	2,721	1,840	47.9	1.083	15	7120.0	0	0
104	Seagull Energy Corp.	79,092	56,723	39.4	7,347	6,196	18.6	131,141	12,000
146	Hadson Petroleum Corp.	36,906	26,873	37.3	4,487	1,360	229.9	16,100	12,050
266	Newhall Resources	9,933	7,430	33.7	5,746	5,574	3.1	0	0
17	Coastal Corp.	772,000	577,900	33.6	142,400	101,700	40.0	3,861,900	992,400
320	Appalachian Oil & Gas Co.	2,546	1,958	30.0	587	24	2345.8	672	722
217	Plains Petroleum Co.	12,006	9,397	27.8	4,456	§ 263	—	0	0
275	Energy Assets International Corp.	3,881	3,073	26.3	643	25	2472.0	2,450	2,475
61	Total Petroleum (North America) Ltd.	360,155	287,666	25.2	85,902	16,453	422.1	233,648	303,938
355	Double Eagle Petroleum & Mining Co.	2,661	2,191	21.5	501	6	8250.0	0	46
73	Unimar Corp.	160,894	136,179	18.2	8,391	6,286	33.5	384,283	47,262
255	Swift Energy Co.	5,402	4,624	16.8	778	583	33.5	23	129
62	Hamilton Oil Corp.	288,117	249,708	15.4	26,452	16,884	56.7	383,691	330,903

* Companies were selected based on growth in stockholders' equity. Only companies with positive net income for both 1984 and 1985 were considered. Companies were not considered if they had a decline in net income for 1985, were subsidiaries of another company, or became public within the last year.
† Four months only. § Three months only.

Rank by total assets			Total assets	Total revenue		Net income		Stockholders' equity		Capital & Expl. spending	
1985	1984	Company	$000	Rank	$000	Rank	$000	Rank	$000	Rank	$000
1	1	**Exxon Corp.**	69,160,000	1	92,869,000	1	4,870,000	1	29,096,000	1	10,339,000
2	2	**Mobil Corp.**	41,752,000	2	60,609,000	6	1,040,000	4	14,089,000	6	3,513,000
3	4	**Chevron Corp.**	38,899,000	4	45,325,000	4	1,547,000	2	15,554,000	4	4,035,000
4	3	**Texaco Inc.**	37,703,000	3	47,514,000	5	1,233,000	5	13,628,000	7	2,824,000
5	6	**Shell Oil Co.**	26,528,000	7	20,477,000	3	1,650,000	3	14,129,000	3	4,080,000
6	5	**Amoco Corp.**	25,198,000	5	28,873,000	2	1,953,000	6	11,588,000	2	5,306,000
7	8	**Tenneco Inc.**	20,437,000	10	15,332,000	16	172,000	8	5,903,000	11	1,719,000
8	7	**Atlantic Richfield Co.**	20,279,000	6	23,080,000	393	(202,000)	9	5,506,000	5	3,595,000
9	9	**Standard Oil Co.**	18,330,000	13	13,915,000	13	308,000	7	8,018,000	8	2,477,000
10	10	**Phillips Petroleum Co.**	14,045,000	8	15,800,000	11	418,000	18	1,644,000	15	1,060,000
11	11	**Sun Co. Inc.**	12,923,000	11	15,076,000	10	527,000	10	5,289,000	10	1,748,000
12	12	**Occidental Petroleum Corp.**	11,585,868	9	15,643,914	8	696,003	11	3,281,021	14	1,151,733
13	13	**Unocal Corp.**	10,797,000	14	11,641,000	12	325,000	19	1,630,000	9	1,847,400
14	14	**Marathon Oil Co.**[1]	10,074,000	15	10,462,000	7	[2]804,000	—	NA	13	1,165,000
15	15	**Conoco Corp.**[3]	9,902,000	12	14,846,000	9	[4]572,000	—	NA	12	1,402,000
16	17	**Enron Corp.**[5]	9,892,727	16	10,271,262	350	(14,055)	17	1,650,345	20	591,224
17	35	**Coastal Corp.**	8,294,300	19	7,310,700	22	142,400	34	772,000	36	341,300
18	16	**Amerada Hess Corp.**	6,219,453	18	7,722,542	396	(260,409)	12	2,260,590	17	929,035
19	21	**Columbia Gas System Inc.**	5,835,166	23	4,141,830	389	(93,832)	23	1,422,688	45	219,968
20	32	**MidCon Corp.**[7]	5,809,878	24	4,132,976	33	70,004	27	1,127,496	35	345,869
21	18	**Texas Eastern Corp.**	5,391,732	20	5,489,211	46	40,007	22	1,460,144	29	398,538
22	20	**Panhandle Eastern Corp.**	5,025,578	31	2,959,483	25	124,986	16	1,695,925	43	237,012
23	19	**Diamond Shamrock Corp.**	4,618,000	22	4,183,000	397	(604,700)	14	1,733,000	19	679,900
24	22	**Williams Cos.**[8]	4,337,400	30	3,139,600	53	31,600	26	1,212,800	41	259,000
25	29	**Transco Energy Co.**[9]	4,241,056	26	3,739,157	62	25,661	37	720,394	25	479,695
26	23	**Pacific Lighting Corp.**	4,132,577	21	5,147,046	20	155,992	20	1,538,089	24	527,114
27	24	**Ashland Oil Inc.**[7]	3,927,633	17	8,237,939	21	146,722	32	929,411	37	329,096
28	33	**Texas Oil & Gas Corp.**[10,11]	3,818,148	43	1,709,741	14	276,761	13	1,748,787	18	739,418
29	31	**Consolidated Natural Gas Co.**	3,797,759	29	3,294,717	15	212,429	21	1,523,614	23	527,754
30	28	**Kerr-McGee Corp.**	3,702,000	28	3,345,000	23	137,000	15	1,722,000	26	454,000
31	30	**Sonat Inc.**	3,569,585	33	2,550,883	113	3,044	25	1,360,744	22	555,405
32	34	**Enserch Corp.**	3,357,844	27	3,391,035	374	(38,956)	29	1,028,002	27	415,094
33	36	**Pennzoil Co.**	3,299,556	37	2,238,712	28	113,204	35	752,849	21	590,432
34	37	**Champlin Petroleum Co.**[12]	2,982,000	25	3,765,000	24	129,000	31	952,000	33	359,000
35	39	**Murphy Oil Corp.**	2,660,825	38	2,222,343	32	79,704	30	1,014,391	30	397,408
36	47	**Meridian Oil Inc.**[13]	2,188,770	67	414,536	36	59,835	24	1,366,775	38	319,440
37	43	**Mitchell Energy & Development Corp.**[14]	2,060,466	53	914,639	49	35,684	45	541,683	42	251,957
38	44	**Freeport-McMoRan Inc.**	2,058,988	57	722,160	29	111,456	38	718,224	48	207,475
39	41	**Nicor Inc.**	2,037,288	39	2,128,799	391	(152,059)	59	371,245	50	182,048
40	42	**Valero Energy Corp.**	1,994,879	32	2,720,987	50	34,718	48	482,942	81	59,964
41	38	**Union Texas Petroleum Co.**[15]	1,951,836	40	2,059,936	19	165,101	372	(282,056)	31	384,000
42	26	**Mesa Limited Partnership**[17]	1,838,712	—	NA	—	NA	39	[18]708,057	—	NA
43	50	**American Petrofina Inc.**	1,817,256	34	2,421,645	340	(10,163)	42	624,692	47	214,962
44	48	**Montana Power Co.**	1,743,477	66	425,173	26	121,567	40	676,507	64	95,091
45	51	**Arkla Inc.**	1,689,937	50	1,005,907	34	69,490	49	480,597	68	86,300
46	46	**Mapco Inc.**	1,610,953	41	1,907,670	30	104,065	50	437,691	62	100,465
47	49	**Cabot Corp.**[7]	1,594,712	46	1,409,326	387	(86,375)	41	625,711	51	166,129
48	45	**Global Marine Inc.**[19]	1,573,000	69	389,800	395	(220,000)	69	290,600	99	35,900
49	57	**Transco Exploration Partners Ltd.**[9]	1,562,117	71	364,348	333	(6,185)	28	1,123,484	34	348,804
50	55	**Primark Corp.**	1,557,277	42	1,892,180	38	51,244	52	421,892	76	66,349
51	53	**Ocean Drilling & Exploration Co.**[20]	1,424,635	58	648,404	51	33,694	33	839,502	44	229,707

Worldwide liquids production		Worldwide natural gas production		Worldwide liquids reserves		Worldwide natural gas reserves		U.S. liquids production		U.S. natural gas production		U.S. liquids reserves		U.S. natural gas reserves		U.S. net wells drilled	
Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Wells
1	603.0	1	1,509.0	1	6,733.0	1	29,723.0	1	281.0	2	874.0	2	2,722.0	1	17,962.0	1	1,442.0
7	236.0	2	1,318.0	8	2,366.0	2	20,687.0	8	120.0	5	623.0	8	1,036.0	4	7,600.0	4	981.0
3	367.0	5	910.0	2	3,831.0	4	9,994.0	5	214.0	3	766.0	5	2,088.0	3	7,752.0	7	808.0
2	406.0	4	987.0	3	3,020.0	5	8,716.0	4	233.0	1	876.0	7	1,766.0	8	5,803.0	2	1,246.0
8	198.0	6	609.0	7	2,645.0	6	7,292.0	6	193.0	6	602.0	4	2,528.0	6	7,051.0	5	973.0
4	307.0	3	1,029.0	5	2,769.0	3	15,137.0	7	144.0	4	674.0	6	1,782.0	2	9,902.0	3	1,078.0
16	51.00	9	380.0	16	454.0	11	3,570.0	14	37.00	8	380.0	14	318.0	11	3,564.0	12	354.3
6	260.0	7	525.0	4	2,931.0	8	7,065.0	3	237.0	7	482.0	1	2,746.0	7	6,134.0	9	615.0
5	262.3	32	69.70	6	2,647.8	7	7,219.0	2	262.3	28	69.70	3	2,647.8	5	7,219.0	21	206.5
10	118.0	14	201.0	11	1,063.0	10	4,883.0	10	68.00	9	322.0	12	576.0	10	3,580.0	14	285.0
14	82.00	11	270.0	14	848.0	13	3,174.0	9	71.00	11	239.0	9	699.0	12	2,588.0	8	756.0
11	105.0	12	232.0	12	941.0	16	2,474.0	15	29.00	13	219.0	15	261.0	14	2,264.0	17	257.6
12	101.0	8	405.0	13	887.0	9	6,189.0	11	65.00	10	297.0	10	666.0	9	4,728.0	10	579.0
13	94.78	13	210.9	10	1,072.9	12	3,324.6	12	58.48	17	137.7	11	586.4	17	1,797.0	22	206.0
9	139.0	10	302.0	9	1,363.0	14	2,982.0	13	44.00	12	231.0	13	373.0	15	2,105.0	15	279.2
32	8.022	24	92.55	36	43.70	22	1,449.3	41	3.838	23	85.86	32	37.90	20	1,388.1	41	89.1
43	4.490	25	88.40	41	33.43	24	1,223.8	38	[6]4.490	85	[6]8.839	35	[6]33.43	22	[6]1,223.8	35	116.0
15	62.00	16	175.0	15	692.0	17	1,882.0	16	26.00	22	89.00	16	213.0	28	855.0	46	66.0
56	2.589	29	76.66	67	14.38	29	905.7	54	2.125	26	74.49	82	8.378	29	751.4	49	61.0
48	3.700	39	51.00	43	30.40	46	511.0	43	3.700	35	51.00	38	30.40	39	511.0	39	94.0
23	17.81	34	63.54	18	166.5	36	655.5	88	0.978	60	16.17	94	6.659	71	156.3	112	17.1
37	5.138	26	84.56	54	21.95	21	1,514.1	35	4.641	24	83.06	49	17.58	19	1,464.5	33	133.0
19	24.33	21	114.7	21	136.6	32	876.1	30	5.631	20	99.78	33	37.27	30	739.3	18	256.8
91	1.046	79	12.19	127	4.252	61	269.2	82	1.046	73	12.19	121	4.252	53	269.2	89	24.6
49	3.479	38	55.77	58	18.08	48	391.7	44	3.479	33	55.77	47	18.08	42	391.7	44	77.7
41	4.828	66	14.02	37	42.57	92	111.1	36	4.618	70	12.56	34	36.97	96	86.28	26	171.0
31	8.600	81	11.70	33	53.70	69	216.3	86	1.000	75	11.70	113	5.000	61	216.3	31	140.0
33	6.987	15	198.5	39	41.22	19	1,836.3	25	6.987	14	198.5	31	41.22	16	1,836.3	6	938.4
39	4.993	17	150.1	48	26.64	26	1,133.0	37	4.550	15	149.9	44	24.09	23	1,132.0	11	521.0
24	17.30	33	65.10	24	120.5	34	826.4	24	7.700	31	61.20	28	45.00	31	668.8	64	41.6
47	3.774	47	36.10	78	10.44	67	229.1	42	3.774	43	36.10	69	10.44	58	229.1	56	45.2
28	10.93	31	71.37	29	68.50	31	880.9	22	10.91	27	71.37	24	63.80	27	880.9	34	129.0
27	12.72	18	149.2	19	158.0	27	1,010.0	20	12.45	16	138.4	18	156.0	24	932.0	32	133.8
18	24.80	20	115.2	17	188.3	18	1,847.2	17	23.90	18	110.4	17	177.7	18	1,693.9	20	226.0
20	20.10	36	61.40	23	127.3	35	678.2	32	5.000	34	53.80	36	33.30	43	370.2	69	35.2
38	5.000	22	107.0	35	50.30	15	2,563.0	31	5.000	19	107.0	27	50.30	13	2,563.0	13	305.1
21	18.30	37	57.60	25	111.3	38	619.3	18	18.30	32	57.60	20	111.3	33	619.3	28	154.5
60	2.400	44	40.60	65	14.80	39	581.8	50	2.300	45	34.40	62	12.60	40	437.2	48	[15]61.4
81	1.300	63	16.50	100	6.900	83	127.3	71	1.300	61	15.00	91	6.900	76	127.3	76	30.5
26	13.00	171	1.800	138	3.300	143	37.10	72	1.300	167	1.800	135	3.300	136	37.10	161	8.1
17	30.00	19	118.0	20	137.0	20	1,696.0	27	6.000	38	46.00	29	43.00	45	363.0	40	91.7
46	4.001	23	96.71	44	28.90	23	1,255.4	40	3.939	21	95.93	39	28.46	21	1,241.7	77	30.1
34	6.770	55	25.44	38	41.72	68	219.1	26	6.770	51	25.44	30	41.72	60	219.1	23	205.2
134	0.421	62	18.23	108	6.020	49	386.5	153	0.283	87	8.577	163	1.765	75	127.8	70	34.3
150	0.306	51	31.52	113	5.470	37	653.0	149	0.306	48	31.52	106	5.470	32	653.0	86	26.9
59	2.430	—	—	73	12.72	318	1.000	58	1.858	—	—	70	10.06	316	1.000	—	—
76	1.503	46	38.36	77	10.45	44	525.2	65	1.503	42	38.36	68	10.45	37	525.2	24	197.1
139	0.383	164	1.977	147	2.400	114	69.43	134	0.383	161	1.977	141	2.400	107	69.43	137	10.9
42	4.810	28	77.11	52	24.99	43	541.5	34	4.810	25	77.11	43	24.99	35	541.5	43	77.7
205	0.107	145	2.962	—	NA	152	31.00	204	0.107	142	2.962	—	NA	147	31.00	—	NA
30	9.700	41	46.50	34	52.80	52	356.2	48	2.800	37	46.50	46	18.10	51	295.8	96	22.1

Rank by total assets 1985	Rank by total assets 1984	Company	Total assets $000	Total revenue Rank	Total revenue $000	Net income Rank	Net income $000	Stockholders' equity Rank	Stockholders' equity $000	Capital & Expl. spending Rank	Capital & Expl. spending $000
52	52	**Louisiana Land & Exploration Co.**	1,405,300	48	1,179,700	77	10,400	44	566,500	28	400,300
53	54	**Grace Natural Resource Group**[21]	1,285,000	62	512,000	40	[4]47,400	—	NA	91	44,100
54	26	**Mesa Petroleum Co.**[17]	1,256,973	63	484,526	18	167,493	71	268,746	80	62,297
55	76	**Celeron Corp.**[22]	1,234,073	149	36,575	17	[4]167,586	—	NA	16	995,219
56	56	**Zapata Corp.**[7]	1,141,887	78	288,674	384	(71,188)	56	396,987	66	90,306
57	60	**Santa Fe Energy Co.**[23]	1,081,700	61	516,900	27	[4]120,300	—	NA	46	215,000
58	61	**Oneok Inc.**[10]	1,051,491	49	1,049,116	48	37,102	54	408,533	73	75,863
59	—	**American Royalty Trust**[24,25]	1,026,535	148	[26]37,359	71	[26]17,837	36	[27]729,690	—	NA
60	63	**Questar Corp.**	1,005,258	59	643,535	35	61,686	53	413,902	56	120,734
61	64	**Total Petroleum (North America) Ltd.**	1,002,618	35	2,372,129	31	85,902	60	360,155	59	111,936
62	73	**Hamilton Oil Corp.**	974,381	79	282,783	60	26,452	70	288,117	49	195,103
63	65	**Petro-Lewis Corp.**[28]	962,300	87	232,500	363	(24,800)	85	168,400	39	294,557
64	—	**Rowan Cos. Inc.**	949,156	82	272,518	105	3,830	43	578,996	83	57,530
65	68	**National Fuel Gas Co.**[7]	922,290	52	975,525	41	46,947	63	343,026	67	87,712
66	75	**Apache Petroleum Co.**	898,373	84	260,526	390	(115,094)	46	520,092	32	374,553
67	58	**Tesoro Petroleum Corp.**[7]	897,709	36	2,299,504	388	(87,028)	64	336,981	58	113,981
68	69	**MDU Resources Group Inc.**[29]	888,180	68	409,054	56	29,231	75	230,864	90	45,510
69	59	**Reading & Bates Corp.**	872,293	86	234,202	392	(190,682)	72	266,805	55	120,788
70	78	**Equitable Resources Inc.**	861,981	64	476,902	37	54,973	58	386,663	57	117,225
71	71	**Pioneer Corp.**[30]	814,445	70	387,879	45	40,123	55	399,987	82	58,955
72	118	**Diversified Energies Inc.**[31]	792,964	54	912,529	64	22,070	73	241,626	61	105,814
73	70	**Unimar Corp.**[32]	766,390	74	324,223	84	8,391	87	160,894	69	84,166
74	67	**Pogo Producing Co.**	741,570	85	241,382	385	(81,766)	115	58,181	54	124,933
75	62	**Kaneb Services, Inc.**	738,918	93	178,929	72	15,086	61	359,837	94	40,950
76	82	**CENEX (Farmer's Union Central Exchange)**[7]	690,551	47	1,375,813	166	[33]426	66	[34]300,547	107	29,917
77	74	**Inexco Oil Co.**[35]	669,224	97	144,825	377	(45,966)	80	191,622	87	51,909
78	92	**Yankee Companies Inc.**[24]	664,088	88	213,078	110	3,446	137	28,737	245	1,795
79	88	**Quaker State Oil Refining Corp.**	649,129	51	993,003	42	45,892	65	311,864	74	68,204
80	83	**Tosco Corp.**	629,315	44	1,518,949	82	8,867	371	(234,926)	113	26,723
81	79	**Tidewater Inc.**[36]	627,654	75	318,865	379	(47,390)	68	298,957	72	79,118
82	—	**UGI Corp.**	621,855	60	605,514	364	(27,233)	83	174,773	93	42,810
83	81	**Lear Petroleum Corp.**	616,326	65	429,084	378	(47,044)	88	154,179	88	51,449
84	86	**Helmerich & Payne Inc.**[7]	616,034	90	191,970	69	18,498	51	427,860	78	63,582
85	113	**Sunshine Mining Co.**[37]	613,396	95	175,829	380	(57,624)	81	187,829	130	21,557
86	96	**BHP Petroleum (Americas) Inc.**[38,39]	597,642	127	[40]53,069	98	[40]4,715	47	501,254	131	[40]19,466
87	90	**Adobe Resources Corp.**[41]	574,367	116	79,445	394	(219,051)	57	387,094	75	66,478
88	80	**Southern Union Co.**	567,357	73	337,568	70	17,871	89	146,795	103	32,387
89	77	**Noble Affiliates, Inc.**	564,986	94	177,624	269	(893)	67	300,250	53	134,664
90	95	**Apache Corp.**	536,378	99	130,038	86	7,919	77	225,975	60	106,592
91	91	**Forest Oil Corp.**	524,487	98	134,828	80	9,801	102	90,387	71	83,585
92	94	**Wicor Inc.**	521,813	56	834,498	61	26,251	84	169,431	104	32,080
93	85	**Southland Royalty Co.**[42]	519,371	76	309,954	54	30,722	78	193,182	65	94,640
94	89	**Crown Central Petroleum Corp.**	484,287	45	1,491,002	102	4,098	79	191,634	101	33,893
95	84	**Texas Gas Exploration Corp.**[8,43]	471,596	77	306,084	59	26,797	74	240,076	63	96,213
96	98	**Home Petroleum Corp.**[10,44]	430,694	112	90,019	111	3,274	—	NA	86	53,286
97	102	**First Mississippi Corp.**[24]	395,435	80	277,570	68	19,139	82	180,787	79	63,257
98	—	**National Cooperative Refinery Assn.**[24]	394,790	55	899,867	74	[45]13,192	86	[46]166,617	123	23,132
99	—	**Quinoco Cos.**[47]	385,238	111	92,919	318	(3,219)	62	343,248	—	NA
100	104	**Damson Oil Corp.**[7]	355,122	114	89,048	284	(1,332)	104	81,913	108	29,447
101	106	**Primary Fuels Inc.**[8,48]	353,450	103	110,385	371	(35,454)	—	NA	40	268,429
102	97	**Crystal Oil Co.**	341,694	110	94,366	383	(67,831)	367	(31,163)	143	13,338

Worldwide liquids production		Worldwide natural gas production		Worldwide liquids reserves		Worldwide natural gas reserves		U.S. liquids production		U.S. natural gas production		U.S. liquids reserves		U.S. natural gas reserves		U.S. net wells drilled	
Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Wells
25	17.30	27	77.20	27	90.70	42	551.9	21	12.20	29	62.70	25	57.10	50	314.7	42	87.2
55	2.949	56	25.41	42	32.44	64	237.1	59	1.845	53	24.58	61	12.76	59	225.8	87	26.5
—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	—	NA
168	0.217	91	9.584	26	94.53	78	160.6	166	0.217	81	9.584	21	94.53	69	160.6	36	108.7
149	0.312	110	5.869	140	3.089	80	131.3	160	0.268	125	4.132	147	2.228	92	90.22	95	22.6
22	18.20	49	31.80	22	131.3	72	201.0	19	18.20	46	31.80	19	131.3	64	201.0	16	278.7
126	0.525	85	10.42	133	3.895	90	114.1	122	0.525	78	10.42	127	3.895	82	114.1	91	23.7
40	[28]4.867	65	[28]16.21	28	86.79	47	421.8	33	[28]4.867	59	[28]16.21	22	86.79	41	421.8	272	[28]1.5
54	3.016	52	29.82	62	16.12	45	522.4	47	3.016	49	29.82	52	16.12	38	522.4	71	33.0
51	3.110	71	13.55	47	26.77	62	264.6	62	1.640	91	7.950	92	6.830	120	49.55	90	24.2
45	4.126	57	25.29	31	58.37	33	856.0	138	0.366	112	5.239	134	3.374	138	36.60	181	5.6
36	5.747	58	24.27	32	56.36	63	262.2	29	5.747	54	24.27	26	56.40	55	262.2	29	150.2
233	0.068	157	2.265	—	[28]NA	—	[28]NA	233	0.068	155	2.265	—	[28]NA	—	[28]NA	122	13.6
215	0.096	95	8.170	189	1.257	95	108.2	215	0.096	88	8.170	185	1.257	85	108.2	63	42.0
53	3.035	35	61.57	64	15.23	51	361.4	45	[6]3.035	30	[6]61.57	54	[6]15.23	46	[6]361.4	59	43.7
67	2.045	153	2.619	101	6.879	122	58.04	109	0.657	151	2.616	131	3.561	149	28.80	129	12.1
79	1.414	203	0.904	66	14.80	28	912.7	69	1.414	201	0.904	55	14.80	25	912.7	—	—
61	2.341	99	7.595	53	22.04	88	119.4	92	0.875	99	6.589	66	11.69	88	103.9	84	27.6
125	0.541	50	31.58	119	5.133	40	573.3	121	0.541	47	31.58	111	5.133	34	573.3	19	233.3
110	0.702	43	40.81	120	5.060	30	885.6	103	0.702	40	40.81	112	5.060	26	885.6	93	22.9
132	0.428	80	12.00	160	1.952	99	93.80	129	[6]0.428	74	[6]12.00	155	[6]1.952	90	[6]93.80	66	40.2
52	3.086	30	73.29	56	20.45	25	1,213.7	68	1.438	72	12.20	80	8.702	104	71.41	79	29.6
44	4.210	40	50.09	55	21.17	57	320.7	39	4.210	36	50.09	45	20.88	54	263.9	65	40.2
92	1.042	69	13.82	95	7.501	89	118.6	83	1.042	64	13.82	86	7.501	81	118.6	55	47.8
65	2.159	193	1.162	70	13.30	233	5.993	53	2.159	191	1.162	59	13.30	231	5.993	81	28.0
63	2.216	59	21.05	74	11.81	50	366.6	52	2.216	55	21.05	65	11.81	44	366.6	97	22.0
291	0.025	260	0.271	265	0.298	200	10.64	292	0.025	260	0.271	263	0.298	198	10.64	321	0.5
82	1.251	137	3.749	59	17.75	106	85.78	73	1.251	131	3.749	48	17.75	98	85.78	25	172.5
143	0.355	271	0.230	75	11.14	253	3.862	142	0.355	271	0.230	193	1.135	253	3.862	—	—
70	1.925	129	4.233	115	5.446	264	3.166	139	0.364	138	3.324	377	0.007	361	0.209	141	10.3
—	—	213	0.792	—	—	232	6.053	—	—	210	0.792	—	—	230	6.053	187	5.0
141	0.359	67	14.00	182	1.477	84	125.9	140	0.359	62	14.00	180	1.477	77	125.9	111	17.2
84	1.183	75	12.88	76	10.76	66	233.0	76	1.183	68	12.88	67	10.76	57	233.0	104	19.5
105	0.770	100	7.256	85	9.073	77	161.0	101	0.741	100	6.478	83	8.112	89	102.3	75	30.6
83	[40]1.230	104	[40]6.866	46	26.99	55	237.0	75	[40]1.230	96	[40]6.866	40	26.99	56	237.0	—	NA
64	2.192	112	5.431	40	39.80	75	188.7	89	0.948	107	5.431	37	32.30	67	188.7	85	27.6
148	0.315	128	4.239	151	2.275	104	86.52	148	0.315	124	4.239	145	2.275	95	86.52	114	16.5
50	3.328	54	25.53	45	28.84	59	302.6	46	3.023	52	24.32	42	26.12	52	289.2	57	44.4
93	1.039	53	27.20	123	4.606	73	197.1	84	[6]1.039	50	[6]27.20	117	[6]4.606	65	[6]197.1	107	18.7
107	0.743	45	39.24	122	4.835	55	345.4	110	0.654	41	38.59	128	3.820	49	322.5	94	22.9
—	NA	—	NA	327	0.104	319	1.000	—	NA	—	NA	325	0.104	317	1.000	—	NA
35	5.901	42	44.00	30	65.29	41	555.0	28	5.795	39	44.00	23	64.49	36	534.0	38	103.0
89	1.070	92	9.478	96	7.118	107	84.37	80	1.070	82	9.478	87	7.118	99	84.37	177	5.8
29	10.17	48	36.04	71	13.10	60	300.2	23	9.977	44	36.04	64	12.25	63	212.3	54	48.2
74	1.586	366	0.013	81	9.479	371	0.132	63	1.586	366	0.013	73	9.479	371	0.132	82	28.0
118	0.596	120	5.003	164	1.842	149	31.60	112	0.596	114	5.003	160	1.842	144	31.60	60	43.5
77	1.502	132	3.861	88	8.817	129	45.41	66	1.502	128	3.861	78	8.817	124	45.41	52	52.0
78	1.477	64	16.21	89	8.718	79	143.7	67	1.477	58	16.21	79	8.718	72	143.7	186	5.0
102	0.787	98	7.670	125	4.525	116	67.67	97	[6]0.787	92	[6]7.670	119	[6]4.525	109	[6]67.67	88	26.5
69	1.981	60	20.63	50	25.40	56	332.9	74	1.251	56	20.17	56	14.21	70	159.0	30	142.0
62	2.285	70	13.68	72	12.80	94	109.4	51	2.285	65	13.68	60	12.80	84	109.4	249	1.9

Rank by total assets			Total assets	Total revenue		Net income		Stockholders' equity		Capital & Expl. spending	
1985	1984	Company	$000	Rank	$000	Rank	$000	Rank	$000	Rank	$000
103	103	Sabine Corp.	338,702	109	99,328	96	5,416	76	226,516	89	49,699
104	163	Seagull Energy Corp.	300,904	106	106,273	88	7,347	105	79,092	95	40,417
105	119	Depco Inc. (DeKalb Petroleum Corp.)[10,49]	293,600	108	99,400	43	[50]42,900	—	NA	70	83,700
106	107	Texas International Co.	261,222	105	106,850	368	(31,881)	370	(114,725)	96	40,210
107	112	NUI Corp.[7]	256,446	72	341,516	87	7,738	113	64,958	105	31,528
108	131	Templeton Energy Inc.[51]	244,168	192	16,298	275	(982)	97	95,555	159	9,869
109	117	Southwestern Energy Co.	242,915	107	99,966	66	20,968	110	70,637	98	37,685
110	116	Pelto Oil Co.[52]	240,744	122	60,774	63	24,589	—	NA	92	43,249
111	114	Kaiser Energy Inc.[53]	235,242	150	36,010	122	1,955	91	129,823	120	24,700
112	123	Prairie Producing Co.[54]	225,742	154	32,405	351	(14,096)	142	26,904	106	30,129
113	143	Triton Energy Corp.[38]	219,464	132	51,025	79	9,847	96	96,867	85	53,690
114	128	Northern Michigan Exploration Co.[55]	216,531	113	89,771	73	13,445	90	134,083	77	64,998
115	120	Universal Resources Corp.[56]	210,038	140	43,537	97	5,021	93	116,925	119	25,258
116	110	MCO Resources Inc.	198,218	124	59,362	376	(42,530)	125	43,575	121	24,498
117	125	Howell Corp.	183,950	104	107,084	109	3,543	108	75,260	111	27,967
118	132	Felmont Oil Corp.[57]	180,322	118	73,076	90	6,726	—	NA	110	27,973
119	121	Kirby Exploration Co.	178,726	117	76,461	116	2,613	109	73,430	163	9,071
120	133	Moore McCormack Energy Co.[58]	177,700	147	37,800	76	[4]12,000	—	NA	118	25,400
121	136	Bow Valley Petroleum Inc.[59]	171,100	126	54,200	137	[4]1,200	—	NA	146	12,700
122	111	Ensource Inc.	166,728	130	51,918	370	(34,986)	123	44,965	129	21,829
123	140	Tricentrol PLC[59]	165,880	—	NA	112	[4]3,045	—	NA	—	NA
124	108	Tom Brown Inc.[38]	165,193	145	40,447	357	(18,772)	106	79,077	134	17,721
125	138	Wainoco Oil Corp.	158,684	143	42,776	344	(11,728)	153	21,200	116	25,609
126	109	Cenergy Corp.	157,420	136	[60]47,598	381	[60](63,440)	119	48,308	126	[60]22,749
127	139	Pyro Energy Corp.	155,676	100	129,974	81	9,342	111	70,327	156	10,243
128	149	Consolidated Oil & Gas Inc.[61]	153,096	161	27,534	300	(2,186)	205	7,999	115	26,115
129	150	Conquest Exploration Co.	149,366	165	26,477	107	3,658	101	93,120	52	148,001
130	145	Worldwide Energy Corp.	141,461	119	68,661	355	(17,321)	130	37,138	102	33,811
131	135	Sage Energy Co.[24]	139,435	120	65,413	341	(10,265)	107	77,435	100	34,033
132	126	Texas American Energy Corp.	139,383	92	185,705	365	(28,054)	160	18,447	136	16,018
133	147	Allegheny & Western Energy Corp.[24]	134,964	83	270,458	75	12,491	133	33,440	142	13,524
134	156	Asamera Inc.[58]	134,631	81	273,507	94	5,594	—	NA	109	28,083
135	137	Marion Corp.[14,62]	133,903	171	23,481	373	(37,500)	366	(29,542)	197	4,376
136	122	Oxoco Inc.	132,458	139	44,666	386	(84,703)	368	(31,823)	148	11,960
137	130	Houston Oil Trust	125,609	155	31,566	58	28,772	92	[27]125,609	—	NA
138	127	Park-Ohio Industries Inc.	124,064	91	186,190	89	6,946	100	93,805	152	11,066
139	173	Chieftain Development Co. Ltd.[59]	117,716	185	19,207	118	2,202	—	NA	137	15,759
140	192	Snyder Oil Partners	117,326	159	28,993	92	6,204	95	[18]105,758	84	56,818
141	169	Graham-McCormick Oil & Gas Part.[64]	116,297	162	27,468	151	739	135	31,287	209	3,478
142	155	Wiser Oil Co.	115,766	131	51,309	83	8,392	99	94,159	122	23,575
143	—	Freeport-McMoRan Oil & Gas Royalty Trust	113,850	128	52,488	57	29,055	98	[27]94,657	—	NA
144	157	IMC Exploration Co.[24,65]	113,300	115	80,400	67	[66]20,200	—	NA	112	26,900
145	153	San Juan Basin Royalty Trust	111,110	146	40,256	47	39,801	94	[27]109,511	—	NA
146	184	Hadson Petroleum Corp.	108,263	102	117,691	99	4,487	131	36,906	117	25,459
147	144	Kenai Corp.[14]	108,134	134	50,722	367	(31,861)	228	6,042	196	4,519
148	146	Tipperary Corp.	106,223	138	46,032	362	(23,150)	149	22,308	205	3,796
149	158	Global Natural Resources Inc.	103,689	129	51,977	119	2,095	103	87,352	135	16,226
150	159	Unit Drilling & Exploration Co.	99,517	137	46,962	316	(3,019)	117	51,509	139	13,946
151	161	Flag-Redfern Oil Co.	98,797	144	42,579	106	3,757	112	66,685	124	22,943
152	148	May Petroleum Inc.	98,748	163	27,361	366	(31,841)	116	54,781	147	12,324
153	151	Entex Energy Development Ltd.	97,161	157	30,253	369	(32,887)	114	[18]59,595	125	22,891

Worldwide liquids production		Worldwide natural gas production		Worldwide liquids reserves		Worldwide natural gas reserves		U.S. liquids production		U.S. natural gas production		U.S. liquids reserves		U.S. natural gas reserves		U.S. net wells drilled	
ank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Wells
66	2.100	76	12.60	68	14.20	81	129.2	55	2.100	69	12.60	57	14.20	73	129.2	47	62.9
41	0.010	172	1.781	225	0.663	140	37.74	341	0.010	168	1.781	222	0.663	133	37.74	148	9.4
57	2.500	77	12.40	51	25.40	58	305.3	57	1.900	98	6.600	63	12.30	117	53.60	73	32.0
58	2.461	83	11.24	57	19.03	91	114.0	49	2.401	83	8.954	51	16.25	111	66.76	74	30.8
64	0.039	215	0.778	257	0.363	214	8.683	264	0.039	213	0.778	255	0.363	212	8.683	78	29.9
72	0.202	144	3.000	126	4.273	74	190.8	171	0.202	141	3.000	120	4.273	66	190.8	253	1.9
42	0.359	72	13.54	184	1.472	70	215.2	141	0.359	66	13.54	182	1.472	62	215.2	58	43.9
06	0.753	78	12.34	99	6.947	98	104.8	100	0.753	71	12.34	90	6.947	87	104.8	119	13.7
40	0.367	102	7.062	180	1.535	86	121.2	137	0.367	94	7.062	178	1.535	79	121.2	72	33.0
16	0.606	119	5.087	69	13.36	113	69.70	111	0.606	113	5.087	58	13.36	106	69.70	100	20.3
73	1.601	89	9.668	60	17.53	161	23.92	127	0.453	152	2.493	157	1.883	184	14.45	130	12.0
71	1.900	93	8.900	94	7.600	115	69.10	60	1.810	84	8.900	93	6.700	108	69.10	45	76.0
14	0.693	94	8.594	118	5.181	109	81.72	107	0.693	86	8.594	110	5.181	101	81.72	61	43.1
03	0.775	74	12.94	129	4.116	100	92.67	98	[6]0.775	67	[6]12.94	123	[6]4.116	91	[6]92.67	158	8.3
96	0.899	136	3.773	82	9.399	103	87.84	91	0.892	136	3.482	75	9.205	105	70.34	154	8.6
04	0.773	86	10.39	128	4.124	102	88.14	99	0.773	79	10.39	122	4.124	94	88.14	80	29.0
24	0.542	123	4.733	139	3.172	165	23.01	120	[6]0.542	118	[6]4.733	136	[6]3.172	160	[6]23.01	266	1.6
00	0.803	141	3.512	87	8.870	126	50.23	95	0.803	135	3.512	77	8.870	119	50.23	135	11.1
95	0.996	131	4.121	63	15.43	131	44.30	87	0.996	127	4.121	53	15.43	125	44.30	195	4.3
15	0.678	90	9.639	105	6.364	82	128.6	108	0.678	80	9.639	98	6.364	74	128.6	83	27.9
349	0.008	124	4.653	345	0.069	118	64.03	349	0.008	119	4.653	344	0.069	112	64.03	101	20.3
90	1.050	152	2.653	92	7.698	121	59.41	81	1.050	150	2.653	84	7.698	114	59.41	108	18.0
61	0.246	87	9.855	173	1.660	71	203.3	146	0.331	137	3.446	116	4.909	121	48.55	202	3.8
97	[60]0.893	125	[60]4.637	103	6.405	119	63.71	90	[60]0.893	120	[60]4.637	96	6.405	113	63.71	125	[60]12.7
65	0.238	160	2.025	196	1.098	183	15.89	163	0.238	158	2.025	195	1.098	179	15.89	121	13.6
17	0.596	118	5.138	93	7.694	76	185.9	116	0.584	115	4.938	85	7.561	68	177.5	149	9.2
46	0.340	105	6.227	161	1.946	112	77.04	145	0.340	101	6.226	156	1.946	103	77.04	120	13.7
87	1.118	73	13.21	84	9.147	110	80.44	124	0.510	145	2.771	115	4.991	176	17.11	178	5.7
80	1.328	106	6.174	90	8.480	139	38.06	70	1.328	102	6.174	81	8.480	132	38.06	53	50.1
121	0.568	149	2.727	117	5.296	163	23.58	117	0.568	147	2.727	109	5.296	158	23.58	102	20.1
387	(s)	206	0.842	387	0.001	172	20.84	387	(s)	204	0.842	387	0.001	168	20.84	117	14.0
236	0.065	305	0.111	317	0.119	359	0.258	236	0.065	305	0.111	315	0.119	357	0.258	—	NA
173	0.199	186	1.273	152	2.263	186	14.87	172	0.199	184	1.273	146	2.263	183	14.87	308	0.7
131	0.436	130	4.130	179	1.551	154	28.61	128	0.436	126	4.130	177	1.551	150	28.61	258	1.7
101	0.793	103	6.924	143	[63]2.661	145	[63]35.83	96	0.793	95	6.924	138	[63]2.661	139	[63]35.83	131	11.9
178	0.168	140	3.561	142	2.701	108	83.39	179	0.168	134	3.561	137	2.701	100	83.39	92	23.0
151	0.304	261	0.271	112	5.673	215	8.574	150	0.304	261	0.271	105	5.673	213	8.574	235	2.3
123	0.552	127	4.332	114	5.459	134	42.29	119	0.552	122	4.332	107	5.459	127	42.29	256	1.8
175	0.180	96	8.053	178	1.552	96	107.3	176	0.180	89	8.053	176	1.552	86	107.3	—	NA
88	1.108	111	5.710	80	9.733	105	85.96	79	[6]1.108	105	[6]5.710	72	[6]9.733	97	[6]85.96	37	105.4
128	0.486	84	10.74	215	0.788	135	41.75	125	0.486	77	10.74	214	0.788	128	41.75	—	NA
119	0.595	82	11.28	134	3.800	101	89.70	113	0.595	76	11.28	129	3.800	93	89.70	68	36.0
228	0.075	68	13.97	159	1.974	54	346.4	228	0.075	63	13.97	154	1.974	48	346.4	152	8.6
163	0.242	146	2.962	197	1.090	166	22.63	162	0.242	143	2.962	196	1.090	161	22.63	113	16.8
224	0.083	227	0.629	277	0.242	256	3.605	224	0.083	226	0.629	275	0.242	256	3.605	227	2.8
383	(s)	386	0.002	383	0.004	385	0.026	383	(s)	386	0.002	383	0.004	385	0.026	206	3.6
136	0.408	88	9.799	145	2.483	97	105.9	135	0.380	97	6.609	172	1.612	167	21.20	132	11.5
198	0.120	170	1.821	230	0.572	190	13.55	198	0.120	166	1.821	228	0.572	188	13.55	159	8.3
94	1.000	122	4.838	106	6.144	138	38.57	85	1.000	117	4.838	99	6.144	131	38.57	99	20.6
177	0.175	101	7.112	210	0.825	136	40.82	178	0.175	93	7.112	209	0.825	129	40.82	67	38.0
133	0.422	107	6.157	131	3.949	132	44.00	130	0.422	103	6.157	125	3.949	126	44.00	147	9.7

Rank by total assets			Total assets	Total revenue		Net income		Stockholders' equity		Capital & Expl. spending	
1985	1984	Company	$000	Rank	$000	Rank	$000	Rank	$000	Rank	$000
154	142	**Callon Petroleum Co.**	94,896	152	34,106	375	(41,107)	352	(1,663)	132	18,881
155	154	**Pend Orielle Oil & Gas Corp.**[67]	91,868	141	43,511	78	[4]9,852	—	NA	128	21,832
156	—	**Thermal Exploration Inc.**[7,68]	86,856	251	4,947	223	[68](169)	—	NA	144	13,141
157	167	**SPG Exploration Corp.**[69]	84,667	153	32,687	291	[4](1,521)	—	NA	160	9,310
158	174	**Chapman Energy Inc.**	81,758	184	20,781	184	177	136	28,878	170	7,978
159	134	**American Quasar Petroleum Co.**	76,384	167	25,311	382	(65,446)	369	(65,039)	251	1,693
160	170	**Magic Circle Energy Corp.**[62]	76,363	172	23,405	233	(315)	278	2,312	274	1,151
161	166	**Pauley Petroleum Inc.**[10]	75,190	89	198,226	120	2,082	148	22,735	161	9,270
162	—	**Walker Energy Partners**[70]	71,363	181	21,891	352	(16,171)	121	[18]47,368	183	5,976
163	152	**Alamco Inc.**	68,354	174	23,062	343	(11,271)	167	15,191	202	4,129
164	175	**Wilshire Oil Co. of Texas**	67,534	202	13,023	121	2,016	156	19,558	168	8,110
165	—	**ConVest Energy Partners Ltd.**	61,484	178	22,387	348	(13,537)	122	[18]46,353	180	6,201
166	160	**Argo Petroleum Corp.**	60,146	177	22,572	372	(36,809)	363	(15,178)	204	3,827
167	168	**Galaxy Oil Co.**	59,678	197	14,243	361	(21,695)	188	10,681	208	3,664
168	190	**McFarland Energy Inc.**	58,571	186	19,117	103	4,050	129	37,651	166	8,661
169	185	**Equity Oil Co.**	58,460	183	21,108	104	3,954	127	39,847	150	11,254
170	178	**Beard Oil Co.**	56,554	125	58,895	85	8,294	152	21,276	154	10,609
171	194	**Patrick Petroleum Co.**	55,597	210	10,265	125	1,848	126	42,100	172	7,560
172	172	**OKC Limited Partnership**	55,200	121	62,248	55	30,247	120	[18]47,765	177	6,460
173	253	**American Exploration Co.**	54,773	206	10,654	182	205	155	20,738	97	38,043
174	187	**Drillers Inc.**[36]	53,698	175	22,675	330	(5,438)	159	18,510	302	683
175	182	**May Energy Partners Ltd.**	53,323	173	23,267	358	(19,873)	138	28,408	114	26,573
176	—	**Samson Energy Co.**[72]	51,436	191	16,663	266	(863)	124	43,791	230	2,301
177	177	**LL&E Royalty Trust**	50,060	142	42,876	44	41,913	118	50,054	—	NA
178	—	**Houston Oil Fields Co.**	50,003	201	13,266	294	(1,822)	157	18,870	165	8,686
179	171	**Maynard Oil Co.**	49,218	158	29,888	95	5,503	134	31,666	127	22,185
180	212	**Petroleum Investments Ltd.**	48,473	198	14,106	310	(2,711)	128	37,811	213	3,327
181	—	**Tribune/Swab-Fox Cos. Inc.**	48,436	135	49,242	117	2,490	140	27,749	199	4,283
182	66	**Fuel Resources Inc.**[7,73]	45,959	218	8,972	178	267	—	NA	155	10,312
183	199	**Statex Petroleum Inc.**[56]	43,742	189	17,056	271	(899)	145	25,140	138	15,000
184	—	**Deminex U.S. Oil Co.**	43,398	156	30,540	126	1,843	168	15,125	141	13,537
185	196	**Fuel Resources Development Co.**[61]	42,382	211	10,129	147	846	151	21,522	211	3,380
186	198	**KenCope Energy Cos.**[24]	41,406	169	23,634	200	(29)	141	26,911	169	8,079
187	181	**Federated Natural Resources Corp.**	41,194	190	16,971	336	(7,806)	185	11,104	158	9,974
188	189	**Energy Ventures Inc.**	40,907	199	14,070	323	(4,137)	146	23,525	333	365
189	203	**Rocky Mountain Natural Gas Co. Inc.**[74]	40,511	160	27,686	153	734	181	11,770	190	4,728
190	—	**Midland SouthWest Corp.**	40,056	164	26,789	356	(17,787)	232	5,570	234	2,203
191	202	**Presidio Oil Co.**[24]	38,760	228	7,904	134	1,407	144	25,279	176	6,507
192	217	**Bogert Oil Co.**[7]	38,340	187	18,841	129	1,814	166	15,629	145	12,978
193	—	**Devon Resource Investors**[75]	38,114	204	11,818	146	950	132	[18]34,034	173	6,853
194	204	**MSR Exploration Ltd.**	37,688	215	9,242	154	715	139	27,848	218	2,759
195	195	**MacMillan Ring Free Oil Co. Inc.**	37,355	96	173,906	243	(463)	211	7,624	239	2,053
196	200	**Plains Resources Inc.**	37,269	260	4,347	250	(606)	204	8,014	140	13,557
197	241	**Alexander Energy Corp.**[36]	36,860	221	8,576	159	476	169	14,765	188	4,935
198	211	**Royal Resources Corp.**[24]	35,687	217	9,016	127	1,841	143	26,341	157	10,022
199	247	**Energy Oil Inc.**[24]	35,472	195	15,068	114	2,975	209	7,679	133	18,298
200	—	**Calumet Industries Inc.**[7]	33,428	123	60,329	132	1,467	171	14,219	279	1,087
201	223	**Shanley Oil Co.**	32,241	166	25,758	216	(141)	180	11,875	175	6,767
202	179	**Trinity Resources Ltd.**	31,170	203	12,519	353	(16,573)	163	17,648	187	5,207
203	180	**Ethyl Corp. (Oil & Gas Segment)**	30,900	176	22,600	91	[4]6,300	—	NA	179	6,300
204	—	**Belden & Blake Energy Co.**	30,828	214	9,428	165	435	147	[18]23,213	178	6,411

Worldwide liquids production		Worldwide natural gas production		Worldwide liquids reserves		Worldwide natural gas reserves		U.S. liquids production		U.S. natural gas production		U.S. liquids reserves		U.S. natural gas reserves		U.S. net wells drilled	
Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Wells
120	0.585	138	3.680	137	3.400	176	17.88	115	0.585	132	3.680	133	3.400	172	17.88	160	8.2
127	0.516	179	1.547	86	8.987	144	36.99	123	0.516	177	1.547	76	8.987	137	36.99	—	NA.
—	NA	—	NA	314	0.128	237	5.284	—	NA	—	NA	312	0.128	236	5.284	—	NA
137	0.401	97	8.012	121	5.000	93	110.0	132	0.401	90	8.012	114	5.000	83	110.0	143	10.0
170	0.206	167	1.866	188	1.273	175	18.22	169	0.206	164	1.866	184	1.273	171	18.22	110	17.5
145	0.341	139	3.587	174	1.623	128	46.29	144	[6]0.341	133	[6]3.587	171	[6]1.623	123	[6]46.29	273	1.5
159	0.272	158	2.251	109	5.978	124	56.08	159	0.272	156	2.251	102	5.978	115	56.08	268	1.6
86	1.130	226	0.640	79	9.897	193	12.32	78	1.130	225	0.640	71	9.897	191	12.32	167	7.2
160	0.248	121	4.887	150	2.318	137	40.28	161	0.248	116	4.887	144	2.318	130	40.28	332	0.3
251	0.051	150	2.722	246	0.461	125	51.42	251	0.051	148	2.722	244	0.461	118	51.42	191	4.6
164	0.241	156	2.308	141	2.903	148	32.80	174	0.185	170	1.718	168	1.707	181	15.25	109	18.0
122	0.564	147	2.830	136	3.508	158	26.19	118	0.564	144	2.830	132	3.508	154	26.19	252	1.9
112	0.696	163	1.988	61	16.54	130	44.33	105	0.696	180	1.364	50	16.54	143	31.76	—	—
147	0.318	188	1.247	104	6.376	117	66.98	147	0.318	186	1.247	97	6.376	110	66.98	50	58.6
113	0.694	196	1.067	83	9.354	209	9.065	106	0.694	194	1.067	74	9.354	206	9.065	123	13.2
109	0.716	200	1.030	91	8.245	120	61.22	114	0.594	212	0.784	101	6.132	116	55.70	198	4.1
135	0.421	148	2.740	162	1.855	189	13.92	131	0.421	146	2.740	158	1.855	187	13.92	98	20.8
210	0.101	277	0.208	214	0.797	287	2.275	210	0.101	277	0.208	213	0.797	286	2.275	225	2.8
75	[71]1.543	115	[71]5.281	107	6.143	141	37.51	64	[71]1.543	109	[71]5.281	100	6.143	134	37.51	303	0.8
308	0.018	194	1.155	149	2.347	184	15.57	175	0.180	192	1.155	143	2.347	180	15.57	193	4.4
297	0.022	222	0.670	290	0.204	238	5.192	298	0.022	221	0.670	288	0.204	237	5.192	320	0.5
138	0.389	126	4.414	175	1.598	157	26.28	133	0.389	121	4.414	173	1.598	153	26.28	168	7.1
245	0.059	117	5.248	278	0.239	160	24.69	245	0.059	111	5.248	276	0.239	156	24.69	243	2.1
85	1.151	135	3.786	111	5.685	181	16.79	77	1.151	130	3.786	104	5.685	177	16.79	242	2.1
154	0.282	162	2.006	168	1.739	168	22.09	154	0.282	160	2.006	165	1.739	163	22.09	174	6.1
129	0.479	134	3.832	154	2.133	171	21.22	136	0.371	173	1.641	149	2.133	166	21.22	265	1.7
187	0.144	142	3.318	213	0.812	162	23.64	188	0.144	139	3.318	212	0.812	157	23.64	—	NA
235	0.065	209	0.802	266	0.296	222	7.402	235	0.065	207	0.802	264	0.296	220	7.402	185	5.3
—	NA	174	1.659	264	0.312	151	31.10	—	NA	171	1.659	262	0.312	146	31.10	—	NA
171	0.205	154	2.477	166	1.811	147	33.47	170	0.205	153	2.477	162	1.811	141	33.47	106	18.8
99	0.806	133	3.855	98	6.947	159	25.86	94	0.806	129	3.855	89	6.947	155	25.86	62	43.0
227	0.077	155	2.317	217	0.747	85	123.5	227	0.077	154	2.317	216	0.747	78	123.5	144	10.0
252	0.051	234	0.547	282	0.228	244	4.673	252	0.051	234	0.547	280	0.228	243	4.673	157	8.4
156	0.278	168	1.858	205	0.968	206	9.661	156	0.278	165	1.858	204	0.968	203	9.661	171	6.4
144	0.349	165	1.975	156	2.035	207	9.342	143	0.349	162	1.975	151	2.035	204	9.342	—	—
—	NA	257	0.300	—	—	272	2.800	—	NA	257	0.300	—	—	271	2.800	—	—
256	0.047	254	0.327	226	0.659	226	6.700	256	0.047	254	0.327	224	0.659	224	6.700	335	0.3
212	0.100	178	1.565	239	0.502	146	33.59	212	0.100	176	1.565	237	0.502	140	33.59	124	12.9
188	0.143	143	3.291	223	0.665	164	23.44	189	0.143	140	3.291	221	0.665	159	23.44	103	19.9
218	0.090	151	2.718	221	0.701	153	29.49	218	0.090	149	2.718	219	0.701	148	29.49	275	1.5
201	0.113	351	0.040	148	2.373	240	5.148	201	0.113	351	0.040	142	2.373	239	5.148	115	16.0
192	0.130	—	—	207	0.870	—	—	193	0.130	—	—	206	0.870	—	—	287	1.2
167	0.229	177	1.580	202	1.021	174	19.51	165	0.229	175	1.580	201	1.021	170	19.51	142	10.1
200	0.114	166	1.951	190	1.205	156	26.88	200	0.114	163	1.951	187	1.205	152	26.88	169	6.7
176	0.178	218	0.707	209	0.848	221	7.549	177	0.178	216	0.707	208	0.848	219	7.549	116	15.5
181	0.162	175	1.642	163	1.852	155	28.31	182	0.162	172	1.642	159	1.852	151	28.31	51	56.1
220	0.085	—	NA	245	0.471	—	NA	220	0.085	—	—	243	0.471	—	NA	—	—
237	0.063	235	0.545	146	2.425	150	31.10	237	0.063	235	0.545	140	2.425	145	31.10	301	0.9
158	0.273	173	1.746	172	1.686	219	7.674	158	0.273	169	1.746	170	1.686	217	7.674	138	10.9
162	0.243	113	5.319	187	1.416	123	57.23	167	0.216	123	4.248	188	1.198	142	31.81	164	7.7
157	0.274	189	1.242	144	2.650	185	14.92	157	0.274	187	1.242	139	2.650	182	14.92	200	3.9

Rank by total assets 1985	Rank by total assets 1984	Company	Total assets $000	Total revenue Rank	Total revenue $000	Net income Rank	Net income $000	Stockholders' equity Rank	Stockholders' equity $000	Capital & Expl. spending Rank	Capital & Expl. spending $000
205	225	**Equitable Petroleum Corp.**	30,236	223	8,450	143	1,042	207	7,746	203	4,014
206	216	**Baruch-Foster Corp.**	29,507	193	15,716	136	1,309	164	17,178	181	6,162
207	220	**Euratex Corp.**	29,368	233	7,242	287	(1,429)	161	18,043	184	5,955
208	215	**Petroleum Development Corp.**	28,920	196	14,439	170	341	193	9,116	246	1,794
209	219	**Harken Oil & Gas Inc.**	28,821	220	8,689	183	204	150	21,636	242	1,957
210	—	**Petroleum Reserve Corp.**[24]	27,962	224	8,442	131	1,771	—	NA	—	NA
211	214	**Minden Oil & Gas Corp.**[24,76]	27,712	242	6,321	346	(12,192)	288	1,904	171	7,813
212	193	**Bracken Exploration Co.**[77]	26,941	231	7,521	141	1,088	158	18,821	182	6,101
213	213	**Tucker Drilling Co. Inc.**[38]	26,860	168	25,251	199	(29)	154	21,095	189	4,761
214	201	**Partners Oil Co.**	25,995	235	6,943	342	(10,354)	358	(5,570)	272	1,195
215	—	**Leader Development Corp.**[14]	25,965	225	8,147	145	963	191	9,818	270	1,272
216	218	**Adams Resources & Energy Inc.**	25,361	101	127,916	123	1,944	362	(7,916)	220	2,683
217	200	**Plains Petroleum Co.**[78]	24,839	188	17,691	100	4,456	179	12,006	280	1,066
218	235	**Petrominerals Corp.**	24,418	182	21,121	128	1,821	176	13,155	207	3,725
219	245	**Ratex Resources Inc.**[7]	23,795	246	5,773	255	(651)	359	(6,244)	261	1,417
220	246	**Southland Energy Corp.**[14]	23,038	234	[79]7,141	259	[79](704)	178	12,898	235	[79]2,155
221	228	**Western Energy Development Co.**	22,937	265	3,955	317	(3,044)	283	2,125	243	1,934
222	248	**American Frontier Exploration Inc.**[24]	22,904	256	4,687	258	(687)	313	1,036	186	5,505
223	224	**Basic Earth Science Systems Inc.**[38]	22,711	257	4,611	332	(5,578)	177	12,928	248	1,760
224	231	**Wichita Industries Inc.**	22,100	194	15,456	244	(469)	221	6,622	214	3,289
225	—	**Texon Energy Corp.**[80]	21,931	230	7,612	311	(2,716)	208	7,707	252	1,690
226	237	**Lomak Petroleum Inc.**	21,169	179	22,259	305	(2,410)	349	(801)	191	4,725
227	197	**Witco Corp. (Oil & Gas Division)**	21,100	180	21,951	—	NA	—	NA	162	9,130
228	191	**Saxon Oil Co.**	20,573	208	10,327	354	(17,193)	175	13,310	293	855
229	229	**Brock Exploration Corp.**[36]	20,403	216	9,181	115	2,700	218	6,915	231	2,269
230	208	**Hershey Oil Corp.**	20,215	236	6,926	347	(13,433)	172	14,104	193	4,618
231	221	**Summit Energy Inc.**[81]	20,066	237	6,841	328	(4,783)	165	17,005	210	3,432
232	251	**Resource Exploration Inc.**[7]	20,015	222	8,541	124	1,938	170	14,603	192	4,668
233	260	**Nugget Oil Corp.**[80]	19,786	272	3,618	306	(2,450)	299	1,533	229	2,341
234	209	**Jackson Exploration Inc.**	19,675	207	10,488	360	(21,268)	224	6,579	164	8,867
235	—	**High Plains Oil Corp.**[83]	19,293	264	4,016	334	(6,751)	223	6,592	174	6,832
236	233	**Arapaho Petroleum Inc.**	19,232	262	4,304	325	(4,359)	192	9,373	277	1,105
237	—	**Crown Zellerbach Corp. (Energy Div.)**[84]	18,700	170	23,500	65	[4]21,500	—	NA	288	900
238	240	**Sabine Royalty Trust**	18,667	151	35,175	52	33,361	162	[27]17,786	—	NA
239	—	**Home-Stake Royalty Corp.**	18,319	219	8,717	140	1,111	174	13,516	195	4,548
240	242	**Cambridge Royalty Co.**	18,304	253	4,857	273	(940)	187	10,692	326	504
241	244	**Monogram Oil & Gas Inc.**[56]	18,121	282	2,993	257	(665)	206	7,962	377	17
242	243	**Bellwether Exploration Co.**	17,797	241	6,387	276	(1,052)	219	6,881	194	4,610
243	289	**Oregon Natural Gas Development Co.**	17,119	205	11,754	162	447	194	9,091	151	11,236
244	239	**Premier Resources Ltd.**[7]	16,901	239	6,486	320	(3,550)	334	472	247	1,787
245	230	**ConVest Energy Corp.**	16,144	249	5,055	312	(2,769)	200	8,329	227	2,428
246	—	**Home-Stake Oil & Gas Co.**	15,949	232	7,403	167	397	189	9,998	201	4,170
247	252	**Norris Oil Co.**	15,745	305	2,004	302	(2,255)	203	8,299	237	2,062
248	—	**Barrett Resources Corp.**[7]	15,711	288	2,582	188	121	212	7,303	222	2,521
249	249	**Sage Drilling Co. Inc.**[24]	15,558	212	9,717	277	(1,056)	210	7,660	269	1,279
250	—	**Cayman Resources Corp.**	15,538	277	3,275	197	(3)	360	(7,699)	374	22
251	250	**Argonaut Energy Corp.**[38]	15,469	281	3,081	313	(2,819)	201	8,308	198	4,316
252	264	**Seahawk Oil International Inc.**	15,445	268	3,772	180	235	195	8,780	317	561
253	205	**Kimbark Oil & Gas Co.**	15,439	229	7,659	349	(13,750)	237	5,008	289	898
254	262	**Seaxe Energy Corp.**	15,138	366	494	252	(617)	173	13,819	268	1,367
255	268	**Swift Energy Co.**	14,782	273	3,616	149	778	233	5,402	282	1,044

Worldwide liquids production		Worldwide natural gas production		Worldwide liquids reserves		Worldwide natural gas reserves		U.S. liquids production		U.S. natural gas production		U.S. liquids reserves		U.S. natural gas reserves		U.S. net wells drilled	
Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Wells
183	0.155	204	0.872	124	4.562	142	37.19	184	0.155	202	0.872	118	4.562	135	37.19	153	8.6
130	0.462	176	1.603	132	3.902	179	17.17	126	[8]0.462	174	[6]1.603	126	[8]3.902	175	[6]17.17	145	10.0
195	0.126	180	1.479	201	1.022	194	11.76	194	0.126	178	1.479	200	1.022	192	11.76	133	11.3
280	0.029	237	0.527	247	0.456	169	21.45	280	0.029	237	0.527	245	0.456	164	21.45	209	3.5
231	0.069	217	0.757	229	0.583	229	6.516	231	0.069	215	0.757	227	0.583	227	6.516	254	1.8
182	0.160	198	1.048	191	1.155	239	5.163	183	0.160	196	1.048	189	1.155	238	5.163	—	NA
185	0.150	225	0.643	272	0.265	259	3.522	186	0.150	224	0.643	270	0.265	259	3.522	134	11.2
244	0.060	161	2.018	259	0.351	182	16.69	244	0.060	159	2.018	257	0.351	178	16.69	179	5.7
232	0.069	221	0.678	302	0.159	276	2.581	232	0.069	219	0.678	300	0.159	275	2.581	170	6.6
206	0.106	211	0.797	241	0.496	228	6.571	205	0.106	208	0.797	239	0.496	226	6.571	241	2.1
299	0.021	253	0.328	320	0.116	291	2.180	300	0.021	253	0.328	318	0.116	290	2.180	127	12.6
199	0.115	185	1.298	255	0.376	252	3.971	199	0.115	183	1.298	253	0.376	252	3.971	247	2.0
329	0.014	61	19.54	342	0.073	53	349.4	329	0.014	57	19.54	341	0.073	47	349.4	299	0.9
153	0.289	327	0.073	116	5.403	361	0.219	152	0.289	327	0.073	108	5.403	360	0.219	126	12.6
250	0.051	191	1.212	192	1.152	195	11.52	250	0.051	189	1.212	190	1.152	193	11.52	317	0.5
186	[79]0.147	197	[79]1.057	193	1.149	187	14.37	187	[79]0.147	195	[79]1.057	191	1.149	185	14.37	318	[79]0.5
191	0.136	322	0.084	155	2.052	281	2.458	192	0.136	322	0.084	150	2.052	280	2.458	233	2.4
223	0.083	214	0.790	198	1.085	167	22.41	223	0.083	211	0.790	197	1.085	162	22.41	118	13.9
190	0.137	264	0.259	183	1.474	245	4.592	191	0.137	264	0.259	181	1.474	244	4.592	278	1.4
184	0.150	280	0.178	204	1.012	312	1.179	185	0.150	280	0.178	203	1.012	311	1.179	269	1.6
180	0.163	192	1.205	194	1.147	199	10.72	181	0.163	190	1.205	192	1.147	197	10.72	183	5.4
286	0.027	231	0.591	328	0.103	274	2.731	286	0.027	231	0.591	326	0.103	273	2.731	173	6.3
111	0.697	183	1.355	110	5.973	211	9.058	104	0.697	181	1.355	103	5.973	208	9.058	27	164.0
152	0.298	219	0.694	153	2.211	220	7.570	151	0.298	217	0.694	148	2.211	218	7.570	300	0.9
193	0.128	201	1.030	235	0.536	230	6.473	213	0.099	198	1.009	233	0.536	228	6.473	291	1.1
202	0.111	182	1.391	186	1.423	133	42.34	206	0.105	220	0.672	186	1.218	266	3.090	222	2.9
196	0.122	181	1.399	165	1.816	203	10.30	196	0.122	179	1.399	161	1.816	200	10.30	223	2.9
229	0.073	184	1.326	271	[82]0.271	197	[82]11.11	229	0.073	182	1.326	269	[82]0.271	195	[82]11.11	162	8.0
316	0.016	190	1.222	307	0.142	192	12.81	316	0.016	188	1.222	305	0.142	190	12.81	194	4.3
219	0.089	246	0.416	216	0.766	258	3.537	219	0.089	246	0.416	215	0.766	258	3.537	283	1.3
216	0.092	251	0.328	199	1.079	246	4.578	216	0.092	251	0.328	198	1.079	245	4.578	324	0.4
241	0.061	239	0.522	224	0.664	202	10.33	241	0.061	239	0.514	223	0.659	210	9.010	329	0.3
108	0.724	187	1.273	135	3.635	234	5.936	102	0.724	185	1.273	130	3.635	232	5.936	136	11.0
98	0.872	108	5.958	97	7.035	127	47.04	93	0.872	104	5.958	88	7.035	122	47.04	—	—
166	0.236	202	0.910	177	1.560	205	9.727	164	0.236	200	0.910	175	1.560	202	9.727	205	3.7
230	0.070	216	0.766	243	0.484	177	17.53	230	[8]0.070	214	[8]0.766	241	[8]0.484	173	[6]17.53	267	1.6
272	0.033	220	0.679	236	0.533	196	11.35	272	0.033	218	0.679	234	0.533	194	11.35	176	5.8
234	0.067	207	0.807	228	0.584	201	10.56	234	0.067	205	0.807	226	0.584	199	10.56	140	10.7
—	—	224	0.647	—	—	304	1.411	—	—	223	0.647	—	—	303	1.411	295	1.0
213	0.098	169	1.841	219	0.726	180	17.05	290	0.026	199	0.943	328	0.102	215	8.397	290	1.1
211	0.101	236	0.534	238	0.508	248	4.331	211	0.101	236	0.534	236	0.508	247	4.331	334	0.3
169	0.213	208	0.807	185	1.458	208	9.158	168	0.213	206	0.807	183	1.458	205	9.158	218	3.1
239	0.063	296	0.134	176	1.576	173	20.47	239	0.063	296	0.134	174	1.576	169	20.47	296	1.0
284	0.027	295	0.137	306	0.150	255	3.623	284	0.027	295	0.137	304	0.150	255	3.623	226	2.8
339	0.011	262	0.264	330	0.102	330	0.839	339	0.011	262	0.264	329	0.102	328	0.839	236	2.3
276	0.032	228	0.617	298	0.173	236	5.710	276	0.032	227	0.617	296	0.173	235	5.710	248	2.0
267	0.037	238	0.523	233	0.551	225	6.977	267	0.037	238	0.523	231	0.551	223	6.977	163	7.8
243	0.060	263	0.261	158	1.977	231	6.217	243	0.060	263	0.261	153	1.977	229	6.217	313	0.6
179	0.167	199	1.040	227	0.636	216	8.567	180	0.167	197	1.040	225	0.636	214	8.567	203	3.7
364	0.004	354	0.030	301	0.164	227	6.580	364	0.004	354	0.030	299	0.164	225	6.580	—	—
296	0.022	307	0.106	285	0.220	299	1.686	297	0.022	307	0.106	283	0.220	298	1.686	146	9.8

Rank by total assets			Total assets	Total revenue		Net income		Stockholders' equity		Capital & Expl. spending	
1985	1984	Company	$000	Rank	$000	Rank	$000	Rank	$000	Rank	$000
256	319	**Usenco Inc.**[36]	14,626	227	7,908	108	3,640	242	4,365	228	2,384
257	257	**Chaparral Resources Inc.**[61]	14,127	351	777	135	1,311	182	11,521	303	676
258	—	**Michigan Oil Co.**[24,85]	14,031	238	6,712	331	[4](5,567)	—	NA	153	10,770
259	261	**Pyramid Oil Co.**	13,458	209	10,320	222	(154)	183	11,436	236	2,127
260	—	**Oakridge Energy Inc.**[86]	13,316	279	3,227	231	(240)	248	4,080	232	2,216
261	271	**Vermilion Bay Land Co.**[36]	13,158	243	6,303	130	1,771	186	10,928	244	1,873
262	234	**Strata Corp.**	13,059	226	7,972	337	(8,764)	268	2,645	—	NA
263	269	**Dietrich Resources Corp.**[36]	12,725	275	3,483	268	(879)	227	6,071	300	740
264	265	**Permian Basin Royalty Trust**	12,601	133	50,988	39	50,395	199	[27]8,346	—	NA
265	—	**Petromark Resources Co.**[87]	12,500	304	[88]2,009	249	[88](605)	214	7,070	296	[88]798
266	286	**Newhall Resources**	12,106	200	13,339	93	5,746	190	[18]9,933	206	3,738
267	256	**General Hydrocarbons Inc.**	12,097	310	1,909	292	(1,554)	247	4,247	330	409
268	210	**Petrotech Inc.**	12,045	247	5,461	359	(20,828)	311	1,102	267	1,380
269	—	**Great American Partners**	11,607	291	2,481	339	(9,756)	202	[18]8,303	149	11,263
270	273	**Geodyne Resources Inc.**[86]	11,201	284	2,929	138	1,200	357	(3,854)	255	1,612
271	—	**Houston Oil Royalty Trust**	11,195	252	4,894	101	4,189	184	11,195	—	NA
272	314	**Burkhart Petroleum Corp.**[89]	11,084	294	2,423	278	(1,118)	296	1,654	310	604
273	276	**Striker Petroleum Corp.**	11,050	276	3,303	164	438	197	8,663	—	NA
274	356	**Oxford Consolidated Inc.**[90]	10,970	309	[91]1,933	315	[91](2,934)	215	7,006	—	NA
275	309	**Energy Assets International Corp.**[36]	10,897	240	6,482	155	643	249	3,881	212	3,372
276	281	**Thor Energy Resources Inc.**[14]	10,679	244	6,178	152	737	216	6,998	249	1,731
277	297	**Nahama & Weagant Energy Co.**[14]	10,472	270	3,682	186	163	245	4,284	225	2,483
278	—	**Hanna Petroleum Co.**[92]	10,283	283	2,948	322	(4,063)	—	NA	185	5,911
279	266	**Altex Industries Inc.**[7,93]	10,270	274	3,601	319	(3,440)	196	8,680	287	905
280	280	**GeoResources Inc.**	10,025	258	4,554	160	464	225	6,359	283	994
281	290	**JM Resources Inc.**[24]	9,902	297	2,301	161	449	273	2,418	217	2,938
282	274	**Golden Oil Co.**[24]	9,586	261	4,329	212	(113)	236	5,235	276	1,116
283	—	**Amcole Energy Corp.**[24]	9,018	255	4,783	248	(597)	310	1,138	265	1,399
284	258	**Great Eastern Energy & Development Corp.**	8,837	286	2,690	345	(11,958)	257	3,259	216	3,011
285	298	**Evergreen Resources Inc.**[36]	8,780	341	929	267	(867)	220	6,820	238	2,058
286	—	**Dorchestor Hugoton Ltd.**	8,744	302	2,072	150	767	198	[18]8,476	353	131
287	308	**Cobb Resources Corp.**[24]	8,522	250	4,968	133	1,424	239	4,755	215	3,143
288	254	**Cibola Energy Corp.**	8,518	271	3,655	335	(7,708)	277	2,317	263	1,400
289	270	**Greenwood Resources Inc.**[94]	8,437	298	2,290	298	(2,035)	280	2,231	321	537
290	305	**Panhandle Royalty Co.**[7]	8,111	266	3,928	139	1,185	241	4,390	200	4,184
291	304	**Alta Energy Corp.**[24]	8,109	296	2,341	218	(143)	295	1,675	258	1,478
292	279	**Deca Energy Corp.**[36]	7,984	336	1,007	307	(2,451)	213	7,303	262	1,405
293	295	**Gerber Energy International Inc.**	7,781	290	2,503	245	(479)	240	4,733	273	1,163
294	311	**Mustang Drilling & Exploration Inc.**	7,676	259	4,529	163	446	229	5,986	260	1,448
295	300	**Credo Petroleum Corp.**[56]	7,557	333	1,029	179	266	222	6,615	320	540
296	301	**Centennial Petroleum Inc.**[36]	7,501	308	1,951	304	(2,385)	354	(1,862)	253	1,688
297	306	**Enex Resources Corp.**	7,435	267	3,842	148	830	226	6,301	312	602
298	310	**QED Exploration Inc.**[81]	7,427	269	3,720	144	1,017	231	5,641	241	1,968
299	277	**Peninsula Resources Corp.**[94]	7,385	263	4,160	326	(4,568)	364	(16,779)	338	293
300	291	**Henry Energy Corp.**[24]	7,156	245	6,033	274	(958)	244	4,308	250	1,694
301	364	**U.S. Minerals Exploration Co.**[36,95]	6,999	356	672	210	(96)	217	6,942	331	391
302	303	**Bayou Resources Inc.**	6,970	278	3,257	176	276	261	3,085	275	1,119
303	312	**Prima Energy Corp.**[24]	6,539	299	2,179	173	316	234	5,366	315	570
304	—	**Northstar Minerals Inc.**[24]	6,521	311	1,878	191	101	298	1,542	322	527
305	293	**Whiting Petroleum Corp.**	6,010	300	2,151	309	(2,489)	235	5,278	256	1,600
306	294	**South Texas Drilling & Exploration Inc.**	5,917	248	5,184	297	(2,035)	351	(1,171)	336	302

Worldwide liquids production		Worldwide natural gas production		Worldwide liquids reserves		Worldwide natural gas reserves		U.S. liquids production		U.S. natural gas production		U.S. liquids reserves		U.S. natural gas reserves		U.S. net wells drilled	
Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Wells
287	0.026	303	0.122	171	1.706	235	5.719	287	0.026	303	0.122	169	1.706	234	5.719	213	3.3
321	0.015	323	0.082	283	0.227	210	9.063	321	0.015	323	0.082	281	0.227	207	9.063	325	0.4
194	0.126	210	0.797	200	1.072	218	7.675	195	0.123	230	0.596	199	1.051	233	5.891	139	10.8
155	0.281	316	0.097	169	1.727	332	0.755	155	0.281	316	0.097	166	1.727	330	0.755	105	19.0
285	0.027	232	0.586	319	0.117	178	17.35	285	0.027	232	0.586	317	0.117	174	17.35	245	2.0
203	0.111	230	0.605	206	0.925	243	4.862	202	0.111	229	0.605	205	0.925	242	4.862	221	3.0
259	0.044	233	0.549	274	0.252	251	4.005	259	0.044	233	0.549	272	0.252	250	4.005	234	2.3
225	0.081	247	0.406	220	0.718	262	3.395	225	0.081	247	0.406	218	0.718	262	3.395	262	1.7
72	1.657	114	5.310	49	26.44	111	78.56	61	1.657	108	5.310	41	26.44	102	78.56	—	NA
247	[88]0.053	256	[88]0.315	231	0.568	275	2.721	247	[88]0.053	256	[88]0.315	229	0.568	274	2.721	257	[88]1.8
174	0.198	159	2.232	181	1.498	170	21.26	173	0.198	157	2.232	179	1.498	165	21.26	128	12.3
273	0.033	249	0.386	262	0.327	212	9.051	273	0.033	249	0.386	260	0.327	209	9.051	279	1.4
189	0.141	229	0.615	211	0.814	217	7.763	190	[6]0.141	228	[6]0.615	210	[6]0.814	216	[6]7.763	231	2.5
270	0.036	248	0.389	279	0.238	242	4.901	270	0.036	248	0.389	277	0.238	241	4.901	—	NA
289	0.026	245	0.417	284	0.226	284	2.350	289	0.026	245	0.417	282	0.226	283	2.350	261	1.7
263	0.040	195	1.121	296	0.178	249	4.091	263	0.040	193	1.121	294	0.178	248	4.091	250	1.9
281	0.028	265	0.254	248	0.435	241	5.094	281	0.028	265	0.254	246	0.435	240	5.094	228	2.7
197	0.120	337	0.059	130	4.091	365	0.167	197	0.120	337	0.059	124	4.091	365	0.167	175	6.0
—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	—	NA
226	0.081	287	0.149	237	0.523	260	3.455	226	0.081	287	0.149	235	0.523	260	3.455	—	—
313	0.017	286	0.156	361	0.046	300	1.607	313	0.017	286	0.156	360	0.046	299	1.607	270	1.5
288	0.026	269	0.237	267	0.294	278	2.556	288	0.026	269	0.237	265	0.294	277	2.556	165	7.6
240	0.063	243	0.449	218	0.741	271	2.893	240	0.063	243	0.449	217	0.741	270	2.893	151	8.9
242	0.061	334	0.061	250	0.399	357	0.297	242	0.061	334	0.061	248	0.399	355	0.297	342	0.2
214	0.097	340	0.058	212	0.813	346	0.454	214	0.097	340	0.058	211	0.813	344	0.454	184	5.4
238	0.063	313	0.098	167	1.758	295	1.811	238	0.063	313	0.098	164	1.758	294	1.811	309	0.7
208	0.103	240	0.514	170	1.710	273	2.798	208	0.103	240	0.514	167	1.710	272	2.798	155	8.5
304	0.019	289	0.146	270	0.273	266	3.121	305	0.019	289	0.146	268	0.273	265	3.121	—	—
246	0.054	319	0.090	269	0.289	342	0.572	246	0.054	319	0.090	267	0.289	340	0.572	156	8.5
290	0.025	308	0.105	208	0.851	288	2.275	291	0.025	308	0.105	207	0.851	287	2.275	201	3.9
—	—	116	5.277	—	—	87	121.0	—	—	110	5.277	—	—	80	121.0	—	—
204	0.109	282	0.175	157	2.020	257	3.576	203	0.109	282	0.175	152	2.020	257	3.576	204	3.7
221	0.084	268	0.246	242	0.490	301	1.568	221	0.084	268	0.246	240	0.490	300	1.568	—	NA
249	0.052	250	0.376	275	0.248	283	2.431	249	0.052	250	0.376	273	0.248	282	2.431	322	0.4
292	0.025	205	0.857	287	[82]0.208	223	[82]7.274	293	0.025	203	0.857	285	[82]0.208	221	[82]7.274	189	4.8
255	0.049	292	0.145	252	0.391	270	2.908	255	0.049	292	0.145	250	0.391	269	2.908	232	2.4
293	0.024	325	0.077	303	0.157	322	0.925	294	0.024	325	0.077	301	0.157	320	0.925	229	2.7
269	0.036	297	0.134	222	0.669	321	0.970	269	0.036	297	0.134	220	0.669	319	0.970	323	0.4
275	0.032	242	0.449	294	0.189	250	4.033	275	0.032	242	0.449	292	0.189	249	4.033	197	4.2
333	0.013	349	0.045	366	0.041	297	1.726	333	0.013	349	0.045	365	0.041	296	1.726	192	4.4
262	0.041	298	0.130	244	0.475	298	1.701	262	0.041	298	0.130	242	0.475	297	1.701	224	2.9
266	0.038	244	0.440	292	0.196	247	4.494	266	0.038	244	0.440	290	0.196	246	4.494	345	0.1
209	0.103	272	0.227	251	0.397	305	1.375	209	0.103	272	0.227	249	0.397	304	1.375	166	7.5
325	0.015	338	0.058	347	0.068	331	0.790	325	0.015	338	0.058	346	0.068	329	0.790	326	0.4
207	0.105	336	0.060	273	0.260	358	0.297	207	0.105	336	0.060	271	0.260	356	0.297	172	6.4
356	0.006	375	0.007	348	0.066	366	0.162	356	0.006	375	0.007	347	0.066	366	0.162	—	NA
258	0.044	212	0.793	260	0.339	198	10.80	258	0.044	209	0.793	258	0.339	196	10.80	276	1.4
319	0.016	312	0.101	368	0.031	293	1.969	319	0.016	312	0.101	367	0.031	292	1.969	210	3.5
347	0.008	343	0.055	323	0.111	360	0.253	347	0.008	343	0.055	321	0.111	359	0.253	211	3.4
260	0.043	306	0.110	263	0.324	307	1.319	260	0.043	306	0.110	261	0.324	306	1.319	319	0.5
373	0.003	335	0.060	378	0.007	338	0.639	373	0.003	335	0.060	378	0.007	336	0.639	330	0.3

Rank by total assets 1985	Rank by total assets 1984	Company	Total assets $000	Total revenue Rank	Total revenue $000	Net income Rank	Net income $000	Stockholders' equity Rank	Stockholders' equity $000	Capital & Expl. spending Rank	Capital & Expl. spending $000
307	263	**KRM Petroleum Corp.**[96]	5,890	—	NA	—	NA	—	NA	—	NA
308	318	**Parallel Petroleum Corp.**	5,830	332	1,088	237	(394)	238	4,918	292	858
309	287	**Fossil Oil & Gas Inc.**[36]	5,778	315	1,739	321	(3,622)	356	(2,928)	325	511
310	317	**Dallas Oil & Minerals Inc.**	5,712	318	1,298	185	164	230	5,645	266	1,386
311	337	**Aztec Resources Corp.**[38]	5,662	349	860	193	66	246	4,254	240	1,989
312	288	**Intercontinental Energy Corp.**[7]	5,599	254	4,824	301	(2,222)	304	1,386	299	748
313	307	**Columbine Exploration Corp.**[61]	5,247	306	1,981	281	(1,279)	346	84	307	640
314	326	**Petra Resources Inc.**[14]	5,205	285	2,801	201	(30)	260	3,124	264	1,399
315	327	**Falcon Oil & Gas Co. Inc.**[14]	5,034	325	1,199	172	331	262	3,062	304	664
316	336	**Roberts Oil & Gas Inc.**[38]	4,692	342	912	220	(151)	253	3,459	291	882
317	—	**Wepco Energy Co.**[98]	4,690	329	1,159	265	(848)	279	2,294	224	2,484
318	282	**Burton/Hawks Inc.**	4,532	287	2,598	327	(4,763)	258	3,180	309	609
319	325	**Regal Petroleum Ltd.**[10]	4,511	319	1,289	181	223	252	3,612	332	384
320	—	**Appalachian Oil & Gas Co. Inc.**[86]	4,460	293	2,434	157	587	270	2,546	314	581
321	332	**Tyrex Oil Co.**[24]	4,323	316	1,607	190	105	243	4,311	281	1,062
322	—	**Terrapet Energy Corp.**	4,321	280	3,146	338	(9,410)	361	(7,824)	167	8,284
323	—	**Petrol Industries Inc.**	4,259	292	2,441	168	357	251	3,617	349	148
324	328	**Midwest Exploration Inc.**[7]	4,253	323	1,257	207	(83)	286	2,031	335	310
325	333	**NP Energy Corp.**[36,62]	4,218	335	1,009	198	(6)	305	1,379	375	18
326	329	**Lyric Energy Inc.**[80]	4,211	359	633	228	(211)	292	1,717	363	33
327	285	**Pangea Petroleum Co.**	4,171	303	2,028	329	(4,839)	314	1,022	334	341
328	313	**Marlin Oil Co.**[80,94]	4,145	331	1,120	303	(2,339)	350	(893)	259	1,450
329	302	**Eagle Exploration Co.**[38]	4,060	307	1,971	314	(2,917)	355	(2,613)	318	554
330	345	**Energy Capital Development Corp.**	4,054	369	470	289	(1,450)	290	1,793	294	855
331	321	**Newport Petroleums Inc.**[14,99]	4,037	321	1,273	280	(1,187)	264	2,783	254	1,653
332	340	**Blackgold Energy Resources Inc.**[36]	4,015	345	886	174	312	287	1,970	278	1,094
333	320	**Circle Seven Oil & Gas Inc.**[38]	3,980	324	1,228	279	(1,169)	294	1,679	219	2,720
334	316	**Melton Drilling & Exploration Co.**	3,958	295	2,382	282	(1,282)	271	2,488	350	138
335	353	**Southern Mineral Corp.**	3,924	289	2,511	142	1,083	266	2,721	340	283
336	351	**Albion International Resources Inc.**	3,810	328	1,170	196	27	291	1,761	290	891
337	—	**Pantepec International Inc.**	3,799	395	109	288	(1,449)	250	3,620	308	[100]622
338	358	**Western Natural Gas Co.**	3,797	352	746	285	(1,359)	263	2,866	221	2,652
339	346	**Hubco Exploration Inc.**	3,662	313	1,805	214	(121)	308	1,162	257	1,497
340	341	**Crescent Oil & Gas Corp.**[7]	3,647	371	421	208	(92)	254	3,346	361	86
341	348	**Reserve Exploration Co.**[36]	3,607	337	1,000	225	(197)	272	2,471	233	2,210
342	—	**Nova Petroleum Corp.**[6]	3,605	343	911	261	(743)	321	869	378	8
343	331	**Aspen Exploration Co.**[24]	3,547	353	719	236	(394)	259	3,135	351	132
344	—	**Colorado Energy Corp.**[86]	3,514	326	1,198	175	291	274	2,388	343	227
345	350	**Plano Petroleum Corp.**[7]	3,482	344	891	187	141	256	3,275	286	940
346	323	**Arch Petroleum Inc.**[101]	3,428	314	1,749	254	(650)	265	2,756	298	795
347	396	**Crown Resource Corp.**	3,395	346	875	230	(224)	255	3,315	316	566
348	354	**Toklan Oil Corp.**[10]	3,344	317	1,456	219	(150)	275	2,378	324	513
349	—	**Hipoint Investments Ltd.**	3,320	347	874	295	(1,922)	365	(17,897)	—	NA
350	—	**Polaris Resources Inc.**[102]	3,304	213	9,472	262	(794)	323	811	370	45
351	299	**Kee Exploration Inc.**	3,296	334	1,020	324	(4,174)	327	658	306	640
352	322	**Intramerican Oil & Minerals Inc.**	3,251	320	1,279	286	(1,377)	306	1,367	311	603
353	315	**Great American Resources Inc.**	3,137	348	860	290	(1,467)	303	1,445	364	82
354	--	**Endevco Inc. (Expl. & Prod. Segment)**[28]	3,121	394	112	195	[4]41	—	NA	223	2,507
355	349	**Double Eagle Petroleum & Mining Co.**[10]	3,029	312	1,854	158	501	267	2,661	313	585
356	330	**Reef Energy Corp.**	2,850	301	2,077	260	(721)	318	879	285	956
357	399	**Questa Oil & Gas Co.**[103]	2,803	327	1,183	177	268	302	1,456	319	552

Worldwide liquids production		Worldwide natural gas production		Worldwide liquids reserves		Worldwide natural gas reserves		U.S. liquids production		U.S. natural gas production		U.S. liquids reserves		U.S. natural gas reserves		U.S. net wells drilled	
Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Wells
—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	—	NA
335	0.011	274	0.217	268	0.292	289	2.257	335	0.011	274	0.217	266	0.292	288	2.257	238	2.2
312	0.017	252	0.328	337	0.088	290	2.238	312	0.017	252	0.328	336	0.088	289	2.238	344	0.1
327	0.014	270	0.236	334	0.090	310	1.280	327	0.014	270	0.236	333	0.090	309	1.280	217	3.2
302	0.020	330	0.068	313	0.132	308	1.300	303	0.020	330	0.068	311	0.132	307	1.300	—	NA
257	0.046	301	0.123	295	0.179	329	0.851	257	0.046	301	0.123	293	0.179	327	0.851	333	0.3
254	0.049	311	0.101	234	0.546	277	2.573	254	0.049	311	0.101	232	0.546	276	2.573	239	2.2
323	0.015	339	0.058	300	0.166	340	[87]0.608	323	0.015	339	0.058	298	0.166	338	[87]0.608	190	4.7
342	0.010	258	0.284	333	0.091	188	14.14	342	0.010	258	0.284	332	0.091	186	14.14	311	0.6
303	0.020	317	0.094	340	0.074	286	2.298	304	0.020	317	0.094	339	0.074	285	2.298	336	0.2
311	0.017	278	0.196	299	0.166	294	1.912	311	0.017	278	0.196	297	0.166	293	1.912	340	0.2
222	0.083	291	0.145	195	1.127	261	3.427	222	0.083	291	0.145	194	1.127	261	3.427	281	1.3
283	0.027	288	0.148	291	[82]0.200	296	[82]1.748	283	0.027	288	0.148	289	[82]0.200	295	[82]1.748	237	2.2
377	0.001	318	0.091	346	0.069	191	12.94	377	0.001	318	0.091	345	0.069	189	12.94	182	5.5
332	0.013	387	(s)	359	0.048	376	0.085	332	0.013	387	(s)	358	0.048	376	0.085	255	1.8
253	0.050	223	0.668	308	0.141	280	2.507	253	0.050	222	0.668	306	0.141	279	2.507	—	—
217	0.090	362	0.016	102	6.493	347	0.447	217	0.090	362	0.016	95	6.493	345	0.447	—	—
268	0.037	299	0.124	384	0.003	350	0.435	268	0.037	299	0.124	384	0.003	348	0.435	337	0.2
378	0.001	300	0.123	375	0.012	263	3.233	378	0.001	300	0.123	374	0.012	263	3.233	—	—
348	0.008	320	0.086	326	0.107	224	7.116	348	0.008	320	0.086	324	0.107	222	7.116	306	0.8
277	0.031	241	0.463	249	0.419	254	3.712	277	0.031	241	0.463	247	0.419	254	3.712	305	0.8
282	0.028	328	0.072	304	0.152	315	1.093	282	0.028	328	0.072	302	0.152	314	1.093	208	3.5
274	0.033	275	0.217	318	0.118	339	0.630	274	0.033	275	0.217	316	0.118	337	0.630	298	1.0
363	0.004	324	0.080	261	0.337	204	9.741	363	0.004	324	0.080	259	0.337	201	9.741	—	—
310	0.018	285	0.157	325	0.107	327	0.894	310	0.018	285	0.157	323	0.107	325	0.894	214	3.3
320	0.015	329	0.068	203	1.014	213	8.706	320	0.015	329	0.068	202	1.014	211	8.706	212	3.4
351	0.008	315	0.097	371	0.022	325	0.901	351	0.008	315	0.097	370	0.022	323	0.901	180	5.6
361	0.005	358	0.023	360	0.047	363	0.199	361	0.005	358	0.023	359	0.047	363	0.199	328	0.3
326	0.015	314	0.097	357	0.049	285	2.334	326	0.015	314	0.097	356	0.049	284	2.334	285	1.3
314	0.016	345	0.048	253	0.382	309	1.300	314	0.016	345	0.048	251	0.382	308	1.300	350	0.1
381	0.001	368	0.011	381	0.005	316	1.052	381	0.001	368	0.011	381	0.005	358	0.257	277	1.4
344	0.010	294	0.141	343	0.073	326	0.897	344	0.010	294	0.141	342	0.073	324	0.897	—	NA
265	0.039	276	0.212	293	0.194	303	1.444	265	0.039	276	0.212	291	0.194	302	1.444	310	0.7
360	0.005	309	0.102	329	0.103	268	3.038	360	0.005	309	0.102	327	0.103	268	3.038	294	1.0
278	0.031	360	0.022	254	0.379	343	0.559	278	0.031	360	0.022	252	0.379	341	0.559	188	4.9
305	0.019	321	0.086	289	0.206	333	0.721	306	0.019	321	0.086	287	0.206	331	0.721	259	1.7
309	0.018	356	0.028	258	0.356	337	0.653	309	0.018	356	0.028	256	0.356	335	0.653	343	0.2
330	0.014	290	0.146	354	0.052	292	2.089	330	0.014	290	0.146	353	0.052	291	2.089	293	1.1
306	0.019	332	0.062	309	0.139	323	0.921	307	0.019	332	0.062	307	0.139	321	0.921	216	3.2
261	0.042	279	0.191	280	0.235	306	1.342	261	0.042	279	0.191	278	0.235	305	1.342	196	4.2
279	0.031	—	—	310	0.138	—	—	279	0.031	—	—	308	0.138	—	—	—	—
315	0.016	266	0.249	305	0.152	314	1.146	315	0.016	266	0.249	303	0.152	313	1.146	240	2.2
328	0.014	304	0.120	341	0.074	341	0.607	328	0.014	304	0.120	340	0.074	339	0.607	347	0.1
354	0.007	371	0.010	351	0.063	378	0.080	354	0.007	371	0.010	350	0.063	378	0.080	—	—
298	0.021	348	0.046	281	0.232	352	0.426	299	0.021	348	0.046	279	0.232	350	0.426	264	1.7
301	0.020	259	0.275	286	0.212	269	2.988	302	0.020	259	0.275	284	0.212	251	3.988	244	2.0
355	0.007	326	0.077	363	0.045	324	0.916	355	0.007	326	0.077	362	0.045	322	0.916	—	NA
—	NA	—	NA	—	[28]NA	—	[28]NA	—	NA	—	NA	—	[28]NA	—	[28]NA	—	NA
248	0.052	331	0.063	256	0.374	311	1.222	248	0.052	331	0.063	254	0.374	310	1.222	282	1.3
295	0.023	267	0.247	331	[82]0.100	313	[82]1.159	296	0.023	267	0.247	330	[82]0.100	312	[82]1.159	260	1.7
358	0.006	273	0.221	362	0.046	282	2.435	358	0.006	273	0.221	361	0.046	281	2.435	—	NA

Rank by total assets 1985	Rank by total assets 1984	Company	Total assets $000	Total revenue Rank	Total revenue $000	Net income Rank	Net income $000	Stockholders' equity Rank	Stockholders' equity $000	Capital & Expl. spending Rank	Capital & Expl. spending $000
358	386	**Roseland Oil & Gas Co. Inc.**[14]	2,712	338	967	171	331	322	829	305	649
359	338	**States Exploration Ltd.**[36,104]	2,697	354	715	299	(2,183)	281	2,145	295	852
360	334	**Love Oil Co. Inc.**[38]	2,635	380	274	272	(929)	269	2,574	301	733
361	—	**Exploration Co.**[10]	2,621	373	403	253	(650)	284	2,102	226	2,465
362	339	**Search Natural Resources Inc.**[86]	2,433	375	357	251	(616)	276	2,319	328	459
363	360	**Sunbelt Exploration Inc.**[10]	2,314	355	673	205	(78)	300	1,472	356	126
364	365	**Wicklund Petroleum Corp.**	2,285	339	953	209	(92)	301	1,467	347	187
365	361	**Impact Energy Inc.**	2,261	370	452	232	(308)	282	2,141	346	189
366	335	**Belcor Inc.**[56,105]	2,220	340	943	293	(1,688)	307	1,346	380	5
367	—	**Willard Pease Oil & Gas Co.**	2,170	322	1,271	169	352	317	879	323	515
368	352	**Oil City Petroleum Inc.**[10]	2,164	357	661	283	(1,320)	328	613	358	95
369	363	**Tide West Oil Co.**[86]	2,083	381	262	247	(538)	285	2,054	271	1,196
370	—	**Diablo Oil Co.**[81]	1,977	374	388	242	(455)	297	1,598	348	163
371	374	**Big Piney Oil & Gas Co.**	1,913	361	552	192	98	289	1,832	368	67
372	369	**Trans Atlantic Resource Corp.**[24]	1,870	330	1,136	256	(661)	329	604	342	247
373	362	**Cheyenne Resources Inc.**	1,834	368	474	264	(833)	312	1,090	337	301
374	376	**Sharon Energy Ltd.**[36]	1,815	378	317	246	(488)	348	(17)	355	128
375	—	**Yellowstone Resources Inc.**	1,771	377	334	213	(115)	293	1,700	329	438
376	379	**EMC Energies Inc.**[24]	1,720	350	851	226	(202)	324	795	327	478
377	324	**Ridgeway Exco Inc.**	1,520	360	579	308	(2,480)	319	877	284	971
378	372	**Loch Exploration Inc.**	1,382	382	258	206	(78)	347	47	379	6
379	385	**Pioneer Oil & Gas Corp.**[7]	1,359	358	636	189	115	309	1,151	344	210
380	382	**Wyoming Oil & Minerals Inc.**[88]	1,206	376	338	203	(36)	326	696	352	131
381	389	**Bolyard Oil & Gas Ltd.**[80]	1,135	367	478	194	53	332	551	371	39
382	392	**TPEX Exploration Inc.**[24]	1,129	372	416	239	(429)	336	440	297	798
383	378	**Tri-Valley Oil & Gas Corp.**[81]	1,104	365	503	211	(108)	340	309	365	78
384	384	**Mountain States Resources Corp.**[36]	1,033	391	144	241	(449)	341	284	372	27
385	381	**Amacan Resources Corp.**[80]	1,019	364	524	215	(124)	315	966	366	70
386	390	**Golden Triangle Royalty Co.**	949	396	90	224	(192)	316	939	354	129
387	355	**Calvin Exploration Inc.**[7]	904	379	293	296	(1,971)	333	486	341	261
388	387	**Score Exploration Corp.**[24]	898	393	141	229	(220)	320	871	360	88
389	368	**Amber Resources Co.**	826	362	539	270	(898)	325	758	373	24
390	377	**PETX Petroleum Corp.**[24]	800	363	532	263	(830)	344	91	339	289
391	391	**Bronco Oil & Gas Co.**[7]	792	385	184	235	(359)	353	(1,763)	381	5
392	394	**Black Giant Oil Co.**[38]	766	390	154	217	(143)	330	570	357	118
393	380	**Shaw Resources Inc.**[36]	689	388	163	240	(431)	331	562	376	17
394	393	**Energy Production Co.**	497	383	237	238	(397)	339	378	369	66
395	—	**Texas Vanguard Oil Co.**	496	384	195	227	(204)	337	424	345	191
396	400	**Petroleum Land Corp.**[56,94,107]	473	389	159	204	(56)	342	237	—	NA
397	395	**Imperial Energy Corp.**[7]	458	386	182	234	(323)	335	454	359	89
398	397	**Houston Oil & Energy Inc.**[24]	444	397	65	221	(152)	338	394	367	70
399	—	**Sterling Oil of Oklahoma Inc.**	270	387	163	156	617	343	236	362	84
400	—	**Pan Energy Resources Inc.**[24,94]	179	392	142	202	(32)	345	89	—	NA
		Totals	**542,225,084**		**572,178,934**		**16,507,657**		**182,251,930**		**66,000,424**

NA = Not available (s) = indicates less than 500 bbl or 500 Mcf. Fiscal yearend is Dec. 31 unless otherwise noted. 1. Subsidiary of USX (formerly U.S. Steel Corp.). 2. Operating income after foreign income taxes. 3. Subsidiary of E.I. duPont de Nemours Corp. 4. Operating income after tax. 5. Formerly HNG InterNorth, after purchase of Houston Natural Gas Corp by InterNorth Inc. 6. May include insignificant amounts of foreign production and reserves. 7. Fiscal yearend Sept. 30. 8. Adopted "successful efforts" accounting in 1985. 9. Transco Energy Co. owns 72% of outstanding units of Transco Exploration Partners Ltd. Most of the production and reserves figures listed for the partnership are also included in the figures for the corporation. 10. Fiscal yearend Aug. 31. 11. Since fiscal yearend has been purchased by USX (formerly U.S. Steel Corp.). 12. Subsidiary of Union Pacific Corp. 13. Subsidiary of Burlington Northern Inc., figures exclude Southland Royalty Co. which was purchased Dec. 1985. 14. Fiscal yearend Jan. 31. 15. Includes Canadian wells. 16. Formerly a wholly owned subsidiary of Allied Corp., became independent after a leveraged buyout mid-1985. 17. Mesa Petroleum Co. transferred all oil & gas properties to the partnership in Dec. 1985. Remaining assets and liabilities will be disposed of in 1986. 18. Partner's equity. 19. Filed Chapter 11, Jan. 1986. 20. Murphy Oil Corp. owns 59.5% of the outstanding stock. 21. Subsidiary of W.R. Grace Co. 22. Subsidiary of Goodyear Tire and Rubber Co. 23. Subsidiary of Sante Fe Southern Pacific Corp. 24. Fiscal yearend June 30. 25. Organized December 31, 1984 from former partnerships sponsored by Petro Lewis Inc. 26. Trust corpus. 27. Six months ended June 30. 28. Company holds oil and gas reserves within the U.S. but is not required to disclose them under Securities and Exchange commission rules. 29. Formerly Montana Dakota Utilities Co. 30. Since fiscal yearend has agreed to merge with Mesa Limited Partnership. 31. Purchased Dyco Petroleum Corp. Oct. 1985. 32. Partnership which operates Enstar Corp. Partnership is owned by Union Texas Petroleum Holding, Inc. and Ultramar PLC but operates independently. 33. Net savings. 34. Member's and patron's equity. 35. Since fiscal yearend Inexco has entered into a merger agreement with Louisiana Land & Exploration. 36. Fiscal yearend Mar. 31. 37. Acquired Woods Petroleum Corp. July 1985. 38. Fiscal yearend May 31. 39. Subsidiary of Broken Hill Proprietary Co. Ltd. 40. Five months ended May 31. 41. Result of merger of Adobe Oil and Gas Corp. and Madison Resources Inc. Figures do not include High Plains Oil Corp., purchased Dec. 1985. 42. Purchased by Burlington Northern Inc. Dec. 1985. 43. Subsidiary of CSX Corp. 44. Subsidiary of Home Oil Corp. 45. Net margins. 46. Stockholder's and member's equity. 47. Subsidiary of Angeles Corp. 48. Subsidiary of Houston Industries. 49. Division of DeKalb Corp. 50. Operating income before interest and corporate income tax. 51. Purchased Amarex Inc. Dec. 1985. 52. Subsidiary of

Worldwide liquids production		Worldwide natural gas production		Worldwide liquids reserves		Worldwide natural gas reserves		U.S. liquids production		U.S. natural gas production		U.S. liquids reserves		U.S. natural gas reserves		U.S. net wells drilled	
Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Mill bbl	Rank	Bcf	Rank	Wells
337	0.011	302	0.123	321	0.116	351	0.430	337	0.011	302	0.123	319	0.116	349	0.430	150	9.0
294	0.023	370	0.011	288	0.207	373	0.104	295	0.023	370	0.011	286	0.207	373	0.104	304	0.8
362	0.005	383	0.004	369	0.031	—	—	362	0.005	383	0.004	368	0.031	—	—	289	1.1
345	0.010	350	0.043	355	0.052	344	0.515	345	0.010	350	0.043	354	0.052	342	0.515	316	0.5
334	0.012	—	—	240	0.497	—	—	334	0.012	—	—	238	0.497	—	—	307	0.7
386	(s)	310	0.102	386	0.003	302	1.474	386	(s)	310	0.102	386	0.003	301	1.474	314	0.6
350	0.008	281	0.176	353	0.053	317	1.039	350	0.008	281	0.176	352	0.053	315	1.039	219	3.0
331	0.013	376	0.007	316	0.123	—	—	331	0.013	376	0.007	314	0.123	—	—	274	1.5
324	0.015	367	0.012	311	0.137	388	0.014	324	0.015	367	0.012	309	0.137	388	0.014	230	2.5
271	0.034	283	0.172	232	0.556	267	3.039	271	0.034	283	0.172	230	0.556	267	3.039	263	1.7
300	0.020	385	0.002	276	0.244	383	0.043	301	0.020	385	0.002	274	0.244	383	0.043	220	3.0
353	0.007	379	0.005	350	0.065	370	0.137	353	0.007	379	0.005	349	0.065	370	0.137	215	3.3
346	0.009	347	0.047	339	0.075	345	0.510	346	0.009	347	0.047	338	0.075	343	0.510	302	0.9
—	—	255	0.326	389	0.001	279	2.531	—	—	255	0.326	389	0.001	278	2.531	292	1.1
367	0.004	380	0.005	374	0.012	384	0.033	367	0.004	380	0.005	373	0.012	384	0.033	284	1.3
336	0.011	357	0.026	315	0.127	348	0.443	336	0.011	357	0.026	313	0.127	346	0.443	341	0.2
375	0.002	342	0.057	379	0.007	320	0.980	375	0.002	342	0.057	379	0.007	318	0.980	280	1.3
340	0.011	369	0.011	336	0.089	368	0.152	340	0.011	369	0.011	335	0.089	368	0.152	251	1.9
322	0.015	346	0.047	297	0.178	334	0.689	322	0.015	346	0.047	295	0.178	332	0.689	315	0.5
307	0.019	372	0.009	338	0.078	354	0.352	308	0.019	372	0.009	337	0.078	352	0.352	271	1.5
352	0.007	365	0.013	332	0.093	362	0.200	352	0.007	365	0.013	331	0.093	362	0.200	—	—
369	0.003	—	—	349	0.066	369	0.144	369	0.003	—	—	348	0.066	369	0.144	246	2.0
343	0.010	384	0.002	335	0.090	336	0.667	343	0.010	384	0.002	334	0.090	334	0.667	346	0.1
371	0.003	341	0.057	365	0.042	265	3.138	371	0.003	341	0.057	364	0.042	264	3.138	338	0.2
338	0.011	344	0.050	322	0.114	353	0.402	338	0.011	344	0.050	320	0.114	351	0.402	348	0.1
384	(s)	293	0.142	390	0.001	328	0.861	384	(s)	293	0.142	390	0.001	326	0.861	331	0.3
366	0.004	381	0.004	370	0.028	387	0.020	366	0.004	381	0.004	369	0.028	387	0.020	—	—
318	0.016	353	0.038	344	0.072	356	0.299	318	0.016	353	0.038	343	0.072	354	0.299	339	0.2
380	0.001	374	0.008	377	[106]0.008	374	[106]0.089	380	0.001	374	0.008	376	[106]0.008	374	[106]0.089	—	NA
379	0.001	333	0.062	385	0.003	349	0.437	379	0.001	333	0.062	385	0.003	347	0.437	351	0.1
365	0.004	377	0.006	356	0.051	372	0.114	365	0.004	377	0.006	355	0.051	372	0.114	—	NA
372	0.003	284	0.166	373	0.013	364	0.193	372	0.003	284	0.166	372	0.013	364	0.193	—	—
317	0.016	355	0.029	324	0.109	367	0.161	317	0.016	355	0.029	322	0.109	367	0.161	207	3.5
368	0.004	363	0.016	376	0.011	381	0.065	368	0.004	363	0.016	375	0.011	381	0.065	312	0.6
68	1.997	109	5.910	380	[106]0.006	386	[106]0.021	56	1.907	106	5.630	380	[106]0.006	386	[106]0.021	—	—
—	—	—	—	312	0.135	377	0.083	—	—	—	—	310	0.135	377	0.083	327	0.4
357	0.006	373	0.009	358	0.049	375	0.088	357	0.006	373	0.009	357	0.049	375	0.088	349	0.1
370	0.003	364	0.015	352	0.057	355	0.312	370	0.003	364	0.015	351	0.057	353	0.312	199	4.0
382	(s)	352	0.038	364	0.044	335	0.681	382	(s)	352	0.038	363	0.044	333	0.681	—	NA
359	0.006	382	0.004	372	0.022	389	0.008	359	0.006	382	0.004	371	0.022	389	0.008	288	1.2
385	(s)	359	0.023	388	0.001	380	0.077	385	(s)	359	0.023	388	0.001	380	0.077	286	1.3
374	0.002	378	0.006	367	0.033	382	0.043	374	0.002	378	0.006	366	0.033	382	0.043	297	1.0
376	0.001	361	0.021	382	0.004	379	0.078	376	0.001	361	0.021	382	0.004	379	0.078	—	—
	3,867.65		**12,763.25**		**37,701.47**		**179,797.68**		**2,417.01**		**10,090.11**		**23,554.69**		**129,258.40**		**18,944.5**

outhdown Inc. 53. Subsidiary of Kaiser Aluminum and Chemical Corp. 54. Subsidiary of Placer Development Ltd. 55. Subsidiary of Consumer's Power Co. 56. Fiscal yearend Oct. 31. 57. Subsidiary of Homestake Mining. 58. Subsidiary of Moore McCormack Resources. 59. U.S. operations only. 60. Nine months ended Dec. 31. 61. Fiscal yearend Nov. 30. 62. Operating under Chapter 11. 63. Reserves as of Oct. 31. 64. Formerly McCormick Oil and Gas Partnership. 65. Subsidiary of International Minerals and Chemicals Corp. 66. Operating ncome before taxes. 67. Subsidiary of Gulf Resources and Chemical Corp. 68. Subsidiary of Washington Energy, financial data includes coal and oil and gas operations. 69. Subsidiary of National Distillers and Chemical Corp. 70. Organized from other partnerships Oct. 1985. 71. Production and reserve sales. 72. Commenced operations as a public company Jan. 1, 986 out of consolidated private partnerships. 73. Subsidiary of Brooklyn Union Gas Co. 74. Purchased by KN Energy Inc. since fiscal yearend. 75. Formed Dec. 1985. 76. Since iscal yearend has merged with Castle Energy Corp. 77. Filed plan for liquidation Jan. 1986. 78. Previously a subsidiary of KN Energy, Inc. Became independent Sept. 1985. 79. Fifteen months ending Jan. 31, 1986. Company changed fiscal yearend from Oct. 31. 80. Fiscal earend Apr. 30. 81. Fiscal yearend July 31. 82. Proved developed reserves. 83. Became a ubsidiary of Adobe Resources Corp. Dec. 27, data is as of Dec. 26. 84. Since fiscal yearend company's oil and gas activities have been purchased by Cavenham Energy Resources, a division of Cavenham Forest Industries Inc. 85. Subsidiary of Sparton Corp. 86. Fiscal yearend Feb. 28. 87. Purchased Ike Lovelady June 13, 1986 and became public. 88. Six months ended Dec. 31. 89. Formed from merger of private Burkhart Petroleum and public Henderson Petroleum. 90. Formed from merger of Antares Oil and Oxford Exploration. Company has U.S. oil and gas reserves but figures were not available when this report was prepared. 91. Unaudited results for nine months ended Dec. 31. 92. Subsidiary of M.A. Hanna Co. 93. Formerly Altex Oil Corp. 94. Figures compiled from unaudited financial statements. 95. Bought Grayhill Exploration Co. 96. Company currently involved in merger negotiation and cannot release additional daa. 97. Includes natural gas liquids. 98. Purchased States Exploration in late 1985. Figures do not include States. 99. Since fiscal yearend has agreed to merge with Mineral Development Inc. 100. Capitalized costs from oil and gas activities. 101. Formerly Sparkman Producing Co. 102. Purchased Overthrust Resources, Ltd. 103. Since fiscal yearend has purchased Trinity Oil & Gas Inc. 104. Since fiscal yearend has been purchased by Wepco, Inc. 105. Formerly Transierra Exploration Co. 106. Working interest only, company holds royalty interest in other properties. 107. Company is changing to Dec. 31 fiscal yearend but revised data was not available when this report was prepared.

The top 20 in net income and in stockholders' equity

Rank	Company name	Net income (Million $)
1	Exxon Corp	4,870.0
2	Amoco Corp	1,953.0
3	Shell Oil Co	1,650.0
4	Chevron Corp	1,547.0
5	Texaco Inc	1,233.0
6	Mobil Corp	1,040.0
7	Marathon Oil Co	804.0
8	Occidental Petroleum Corp	696.0
9	Conoco Corp	572.0
10	Sun Co. Inc	527.0
11	Phillips Petroleum Co	418.0
12	Unocal Corp	325.0
13	Standard Oil Co	308.0
14	Texas Oil & Gas Corp	276.8
15	Consolidated Natural Gas Co	212.4
16	Tenneco Inc	172.0
17	Celeron Corp	167.6
18	Mesa Petroleum Co	167.5
19	Union Texas Petroleum Co	165.1
20	Pacific Lighting Corp	156.0
	Total	**17,260.4**

Rank	Company name	Stockholders' equity (Million $)
1	Exxon Corp	29,096.0
2	Chevron Corp	15,554.0
3	Shell Oil Co	14,129.0
4	Mobil Corp	14,089.0
5	Texaco Inc	13,628.0
6	Amoco Corp	11,588.0
7	Standard Oil Co	8,018.0
8	Tenneco Inc	5,903.0
9	Atlantic Richfield Co	5,506.0
10	Sun Co. Inc	5,289.0
11	Occidental Petroleum Corp	3,281.0
12	Amerada Hess Corp	2,260.6
13	Texas Oil & Gas Corp	1,748.8
14	Diamond Shamrock Corp	1,733.0
15	Kerr-McGee Corp	1,722.0
16	Panhandle Eastern Corp	1,695.9
17	Enron Corp	1,650.3
18	Phillips Petroleum Co	1,644.0
19	Unocal Corp	1,630.0
20	Pacific Lighting Corp	1,538.1
	Total	**141,703.8**

The top 20 in spending and in U.S. net wells drilled

Rank	Company name	Capital & exploratory spending (Million $)
1	Exxon Corp	10,339.0
2	Amoco Corp	5,306.0
3	Shell Oil Co	4,080.0
4	Chevron Corp	4,035.0
5	Atlantic Richfield Co	3,595.0
6	Mobil Corp	3,513.0
7	Texaco Inc	2,824.0
8	Standard Oil Co	2,477.0
9	Unocal Corp	1,847.4
10	Sun Co. Inc	1,748.0
11	Tenneco Inc	1,719.0
12	Conoco Corp	1,402.0
13	Marathon Oil Co	1,165.0
14	Occidental Petroleum Corp	1,151.7
15	Phillips Petroleum Co	1,060.0
16	Celeron Corp	995.2
17	Amerada Hess Corp	929.0
18	Texas Oil & Gas Corp	739.4
19	Diamond Shamrock Corp	679.9
20	Enron Corp	591.2
	Total	**50,196.9**

Rank	Company name	U.S. net wells drilled
1	Exxon Corp	1,442.0
2	Texaco Inc	1,246.0
3	Amoco Corp	1,078.0
4	Mobil Corp	981.0
5	Shell Oil Co	973.0
6	Texas Oil & Gas Corp	938.4
7	Chevron Corp	808.0
8	Sun Co. Inc	756.0
9	Atlantic Richfield Co	615.0
10	Unocal Corp	579.0
11	Consolidated Natural Gas Co	521.0
12	Tenneco Inc	354.3
13	Meridian Oil Inc	305.1
14	Phillips Petroleum Co	285.0
15	Conoco Corp	279.2
16	Santa Fe Energy Co	278.7
17	Occidental Petroleum Corp	257.6
18	Diamond Shamrock Corp	256.8
19	Equitable Resources Inc	233.3
20	Champlin Petroleum Co	226.0
	Total	**12,413.4**

The top 20 in U.S. and world liquids reserves

Rank	Company name	U.S. liquids reserves (Mill bbl)
1	Atlantic Richfield Co	2,746.0
2	Exxon Corp	2,722.0
3	Standard Oil Co	2,647.8
4	Shell Oil Co	2,528.0
5	Chevron Corp	2,088.0
6	Amoco Corp	1,782.0
7	Texaco Inc	1,766.0
8	Mobil Corp	1,036.0
9	Sun Co	699.0
10	Unocal Corp	666.0
11	Marathon Oil Co	586.4
12	Phillips Petroleum Co	576.0
13	Conoco Corp	373.0
14	Tenneco Inc	318.0
15	Occidental Petroleum Corp	261.0
16	Amerada Hess Corp	213.0
17	Champlin Petroleum Co	177.7
18	Pennzoil Co	156.0
19	Santa Fe Energy Co	131.3
20	Mitchell Energy & Development Corp	111.3
	Total	**21,584.5**

Rank	Company name	World liquids reserves (Mill bbl)
1	Exxon Corp	6,733.0
2	Chevron Corp	3,831.0
3	Texaco Inc	3,020.0
4	Atlantic Richfield Co	2,931.0
5	Amoco Corp	2,769.0
6	Standard Oil Co	2,647.8
7	Shell Oil Co	2,645.0
8	Mobil Corp	2,366.0
9	Conoco Corp	1,363.0
10	Marathon Oil Co	1,072.9
11	Phillips Petroleum Co	1,063.0
12	Occidental Petroleum Corp	941.0
13	Unocal Corp	887.0
14	Sun Co. Inc	848.0
15	Amerada Hess Corp	692.0
16	Tenneco Inc	454.0
17	Champlin Petroleum Co	188.3
18	Texas Eastern Corp	166.5
19	Pennzoil Co	158.0
20	Union Texas Petroleum Co	137.0
	Total	**34,913.4**

The top 20 in U.S. and world gas production

Rank	Company name	U.S. gas production (Bcf)
1	Texaco Inc.	876.0
2	Exxon Corp.	874.0
3	Chevron Corp.	766.0
4	Amoco Corp.	674.0
5	Mobil Corp.	623.0
6	Shell Oil Co.	602.0
7	Atlantic Richfield Co.	482.0
8	Tenneco Inc.	380.0
9	Phillips Petroleum Co.	322.0
10	Unocal Corp.	297.0
11	Sun Co. Inc.	239.0
12	Conoco Corp.	231.0
13	Occidental Petroleum Corp.	219.0
14	Texas Oil & Gas Corp.	198.5
15	Consolidated Natural Gas Co.	149.9
16	Pennzoil Co.	138.4
17	Marathon Oil Co.	137.7
18	Champlin Petroleum Co.	110.4
19	Meridian Oil Inc.	107.0
20	Diamond Shamrock Corp.	99.8
	Total	**7,526.8**

Rank	Company name	World gas production (Bcf)
1	Exxon Corp.	1,509.0
2	Mobil Corp.	1,318.0
3	Amoco Corp.	1,029.0
4	Texaco Inc.	987.0
5	Chevron Corp.	910.0
6	Shell Oil Co.	609.0
7	Atlantic Richfield Co.	525.0
8	Unocal Corp.	405.0
9	Tenneco Inc.	380.0
10	Conoco Corp.	302.0
11	Sun Co. Inc.	270.0
12	Occidental Petroleum Corp.	232.0
13	Marathon Oil Co.	210.9
14	Phillips Petroleum Co.	201.0
15	Texas Oil & Gas Corp.	198.5
16	Amerada Hess Corp.	175.0
17	Consolidated Natural Gas Co.	150.1
18	Pennzoil Co.	149.2
19	Union Texas Petroleum Co.	118.0
20	Champlin Petroleum Co.	115.2
	Total	**9,793.8**

The top 20 in U.S. and world liquids production

Rank	Company name	U.S. liquids production (Mill bbl)
1	Exxon Corp.	281.0
2	Standard Oil Co.	262.3
3	Atlantic Richfield Co.	237.0
4	Texaco Inc.	233.0
5	Chevron Corp.	214.0
6	Shell Oil Co.	193.0
7	Amoco Corp.	144.0
8	Mobil Corp.	120.0
9	Sun Co. Inc.	71.0
10	Phillips Petroleum Co.	68.0
11	Unocal Corp.	65.0
12	Marathon Oil Co.	58.5
13	Conoco Corp.	44.0
14	Tenneco Inc.	37.0
15	Occidental Petroleum Corp.	29.0
16	Amerada Hess Corp.	26.0
17	Champlin Petroleum Co.	23.9
18	Mitchell Energy & Development Corp.	18.3
19	Santa Fe Energy Co.	18.2
20	Pennzoil Co.	12.4
	Total	**2,155.6**

Rank	Company name	World liquids production (Mill bbl)
1	Exxon Corp.	603.0
2	Texaco Inc.	406.0
3	Chevron Corp.	367.0
4	Amoco Corp.	307.0
5	Standard Oil Co.	262.3
6	Atlantic Richfield Co.	260.0
7	Mobil Corp.	236.0
8	Shell Oil Co.	198.0
9	Conoco Corp.	139.0
10	Phillips Petroleum Co.	118.0
11	Occidental Petroleum Corp.	105.0
12	Unocal Corp.	101.0
13	Marathon Oil Co.	94.8
14	Sun Co. Inc.	82.0
15	Amerada Hess Corp.	62.0
16	Tenneco Inc.	51.0
17	Union Texas Petroleum Co.	30.0
18	Champlin Petroleum Co.	24.8
19	Diamond Shamrock Corp.	24.3
20	Murphy Oil Corp.	20.1
	Total	**3,491.3**

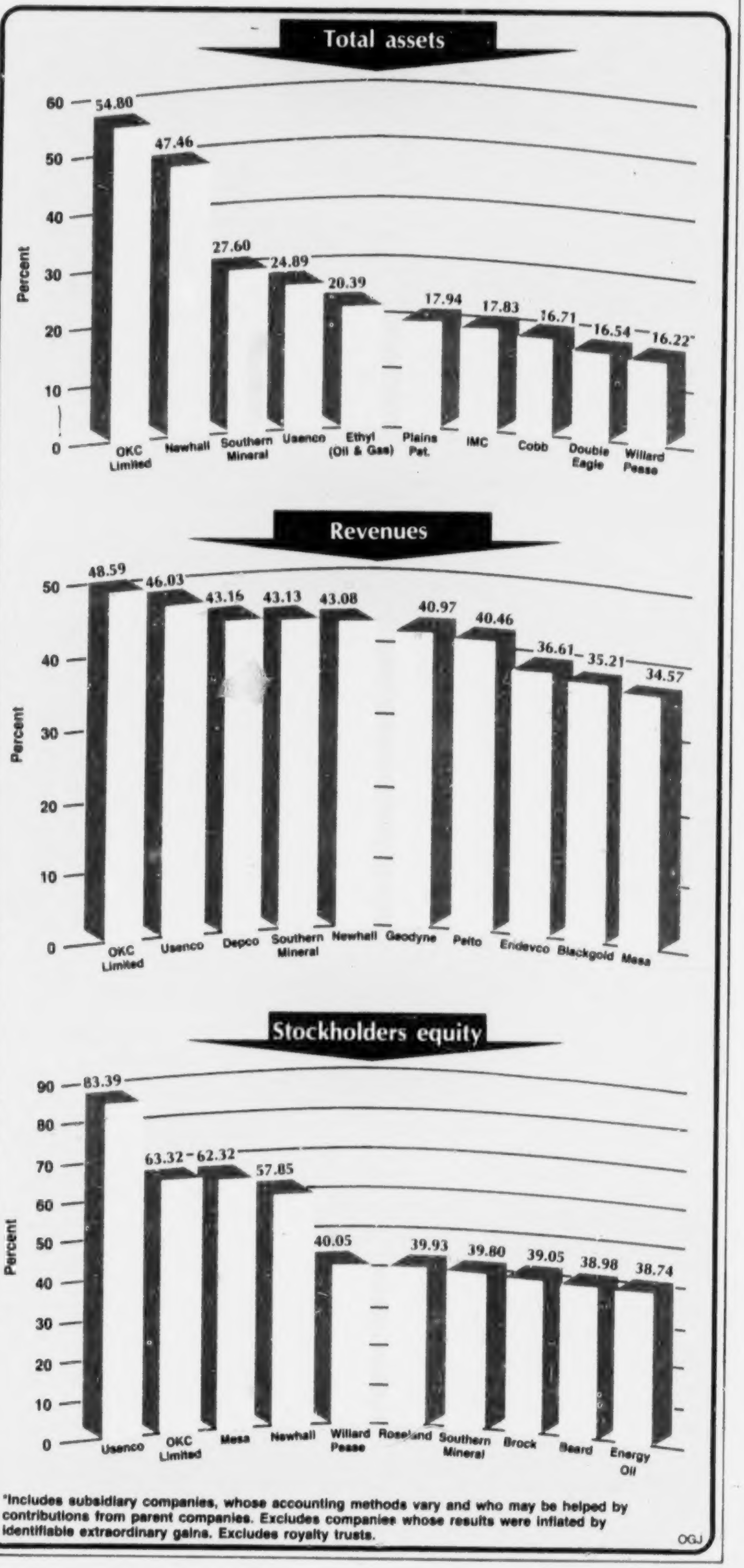
The top 20 in U.S. and world gas reserves

Rank	Company name	U.S. natural gas reserves (Bcf)
1	Exxon Corp.	17,962.0
2	Amoco Corp.	9,902.0
3	Chevron Corp.	7,752.0
4	Mobil Corp.	7,600.0
5	Standard Oil Co.	7,219.0
6	Shell Oil Co.	7,051.0
7	Atlantic Richfield Co.	6,134.0
8	Texaco Inc.	5,803.0
9	Unocal Corp.	4,728.0
10	Phillips Petroleum Co.	3,580.0
11	Tenneco Inc.	3,564.0
12	Sun Co. Inc.	2,588.0
13	Meridian Oil Inc.	2,563.0
14	Occidental Petroleum Corp.	2,264.0
15	Conoco Corp.	2,105.0
16	Texas Oil & Gas Corp.	1,836.3
17	Marathon Oil Co.	1,797.0
18	Champlin Petroleum Co.	1,693.9
19	Panhandle Eastern Corp.	1,464.5
20	Enron Corp.	1,388.1
	Total	**98,994.8**

Rank	Company name	World natural gas reserves (Bcf)
1	Exxon Corp.	29,723.0
2	Mobil Corp.	20,687.0
3	Amoco Corp.	15,137.0
4	Chevron Corp.	9,994.0
5	Texaco Inc.	8,716.0
6	Shell Oil Co.	7,292.0
7	Standard Oil Co.	7,219.0
8	Atlantic Richfield Co.	7,065.0
9	Unocal Corp.	6,189.0
10	Phillips Petroleum Co.	4,883.0
11	Tenneco Inc.	3,570.0
12	Marathon Oil Co.	3,324.6
13	Sun Co. Inc.	3,174.0
14	Conoco Corp.	2,982.0
15	Meridian Oil Inc.	2,563.0
16	Occidental Petroleum Corp.	2,474.0
17	Amerada Hess Corp.	1,882.0
18	Champlin Petroleum Co.	1,847.2
19	Texas Oil & Gas Corp.	1,836.3
20	Union Texas Petroleum Co.	1,696.0
	Total	**142,254.1**

Fig. 1

The top companies in return on...*



*Includes subsidiary companies, whose accounting methods vary and who may be helped by contributions from parent companies. Excludes companies whose results were inflated by identifiable extraordinary gains. Excludes royalty trusts.

OGJ

The OGJ400 Company Index (continued)

Rank by total assets	Company name	Headquarters city
168	**McFarland Energy Inc.**	Sante Fe Springs, CA
116	**MCO Resources Inc.**	Houston
68	**MDU Resources Group Inc.**	Bismark, ND
334	**Melton Drilling & Exploration Co.**	Midland, TX
36	**Meridian Oil Inc.**	Houston
42	**Mesa Limited Partnership**	Amarillo, TX
54	**Mesa Petroleum Co.**	Amarillo, TX
258	**Michigan Oil Co.**	Jackson, MI
20	**MidCon Corp.**	Lombard, IL
190	**Midland SouthWest Corp.**	Midland, TX
324	**Midwest Exploration Inc.**	Oklahoma City
211	**Minden Oil & Gas Corp.**	Houston
37	**Mitchell Energy & Development Corp.**	The Woodlands, TX
2	**Mobil Corp.**	New York
241	**Monogram Oil & Gas Inc.**	North Canton, OH
44	**Montana Power Co.**	Butte, MT
120	**Moore McCormack Energy Co.**	Dallas
384	**Mountain States Resources Corp.**	Midvale, UT
194	**MSR Exploration Ltd.**	Cut Bank, MT
35	**Murphy Oil Corp.**	Dallas
294	**Mustang Drilling & Exploration Inc.**	Great Bend, KS
277	**Nahama & Weagant Energy Co.**	Bakersfield, CA
98	**National Cooperative Refinery Association**	McPherson, KS
65	**National Fuel Gas Co.**	New York
266	**Newhall Resources**	Valencia, CA
331	**Newport Petroleums Inc.**	Dallas
39	**Nicor Inc.**	Naperville, IL
89	**Noble Affiliates Inc.**	Ardmore, OK
247	**Norris Oil Co.**	Beverly Hills, CA
114	**Northern Michigan Exploration Co. (NOMECO)**	Jackson, MI
304	**Northstar Minerals Inc.**	Los Angeles
342	**Nova Petroleum Corp.**	Salt Lake City
325	**NP Energy Corp.**	Los Angeles
233	**Nugget Oil Corp.**	Bloomington, MN
107	**NUI Corp.**	Bridgewater, NJ
260	**Oakridge Energy Inc.**	Wichita Falls, TX
12	**Occidental Petroleum Corp.**	Los Angeles
51	**Ocean Drilling & Exploration Co.**	New Orleans
368	**Oil City Petroleum Inc.**	Tulsa
172	**OKC Limited Partnership**	Dallas
58	**Oneok Inc.**	Tulsa
243	**Oregon Natural Gas Development Co.**	Portland, OR
274	**Oxford Consolidated Inc.**	Denver
136	**Oxoco Inc.**	Houston
26	**Pacific Lighting Corp.**	Los Angeles
400	**Pan Energy Resources Inc.**	West Chester, PA
327	**Pangea Petroleum Co.**	Torrance, CA
22	**Panhandle Eastern Corp.**	Houston
290	**Panhandle Royalty Co.**	Oklahoma City
337	**Pantepec International Inc.**	Hartford, CT
308	**Parallel Petroleum Corp.**	Midland, TX
138	**Park-Ohio Industries Inc.**	Cleveland
214	**Partners Oil Co.**	Houston
171	**Patrick Petroleum Co.**	Jackson, MI
161	**Pauley Petroleum Inc.**	Los Angeles
110	**Pelto Oil Co.**	Houston
155	**Pend Orielle Oil & Gas Co.**	Houston
299	**Peninsula Resources Corp.**	Corpus Christi, TX
33	**Pennzoil Co.**	Houston
264	**Permian Basin Royalty Trust**	Fort Worth
314	**Petra Resources**	Oklahoma City
323	**Petrol Industries Inc.**	Shreveport, LA
208	**Petroleum Development Corp.**	Bridgeport, WV
180	**Petroleum Investments Ltd.**	Oklahoma City
396	**Petroleum Land Corp.**	Pasadena, CA
210	**Petroleum Reserve Corp.**	Tulsa
265	**Petromark Resources Co.**	Tulsa
218	**Petrominerals Corp.**	Stanton, CA
268	**Petrotech Inc.**	Denver
63	**Petro-Lewis Corp.**	Denver
390	**PETX Petroleum Corp.**	Denver
10	**Phillips Petroleum Co**	Bartlesville, OK
71	**Pioneer Corp.**	Amarillo, TX
379	**Pioneer Oil & Gas Corp.**	Midvale, UT
217	**Plains Petroleum Co.**	Lakewood, CO
196	**Plains Resources Inc.**	Oklahoma City
345	**Plano Petroleum Corp.**	Plano, TX
74	**Pogo Producing Co.**	Houston
350	**Polaris Resources Inc.**	Denver
112	**Prairie Producing Co.**	Houston
244	**Premier Resources Ltd.**	Denver
191	**Presidio Oil Co.**	Denver
303	**Prima Energy Corp.**	Denver
50	**Primark Corp.**	McLean, VA
101	**Primary Fuels Inc.**	Houston
259	**Pyramid Oil Co.**	Santa Fe Springs, CA
127	**Pyro Energy Corp.**	Evansville, IN
298	**QED Exploration Inc.**	Denver
79	**Quaker State Oil Refining Corp.**	Oil City, PA
357	**Questa Oil & Gas Co.**	Littleton, CO
60	**Questar Corp.**	Salt Lake City
99	**Quinoco Cos.**	Denver
219	**Ratex Resources Inc.**	Oklahoma City
69	**Reading & Bates Corp.**	Tulsa
356	**Reef Energy Corp.**	Traverse City, MI
319	**Regal Petroleum Ltd.**	Denver
341	**Reserve Exploration Co.**	Tulsa
232	**Resource Exploration Inc.**	Canton, OH
377	**Ridgeway Exco Inc.**	Houston
316	**Roberts Oil & Gas Inc.**	Houston
189	**Rocky Mountain Natural Gas Co. Inc.**	Denver
358	**Roseland Oil & Gas Co. Inc.**	Tyler, TX
64	**Rowan Cos. Inc.**	Houston
198	**Royal Resources Corp.**	Denver
103	**Sabine Corp.**	Dallas
238	**Sabine Royalty Trust**	Dallas
249	**Sage Drilling Co. Inc.**	Wichita, KS
131	**Sage Energy Co.**	San Antonio
176	**Samson Energy Co.**	Tulsa
145	**San Juan Basin Royalty Trust**	Fort Worth
57	**Santa Fe Energy Co.**	Houston
228	**Saxon Oil Co.**	Dallas
388	**Score Exploration Corp.**	Casper, WY
104	**Seagull Energy Corp.**	Houston
252	**Seahawk Oil International Inc.**	Newport Beach, CA
362	**Search Natural Resources Inc.**	Denver
254	**Seaxe Energy Corp.**	Jackson, MS
201	**Shanley Oil Co.**	Dallas
374	**Sharon Energy Ltd.**	Englewood, CO
393	**Shaw Resources Inc.**	Riverside, CA
5	**Shell Oil Co.**	Houston
140	**Snyder Oil Partners**	Fort Worth
31	**Sonat Inc.**	Birmingham, AL
306	**South Texas Drilling & Exploration Inc.**	San Antonio
335	**Southern Mineral Corp.**	Chicago
88	**Southern Union Co.**	Dallas
220	**Southland Energy Corp.**	Tulsa
93	**Southland Royalty Co.**	Fort Worth
109	**Southwestern Energy Co.**	Fayetteville, AR
157	**SPG Exploration Corp.**	San Antonio
9	**Standard Oil Co.**	Cleveland
359	**States Exploration Ltd.**	Denver
183	**Statex Petroleum Inc.**	Irving, TX
399	**Sterling Oil of Oklahoma Inc.**	Tulsa
262	**Strata Corp.**	Columbus, OH
273	**Striker Petroleum Corp.**	Englewood, CO
231	**Summit Energy Inc.**	Dallas
11	**Sun Co. Inc.**	Radnor, PA
363	**Sunbelt Exploration Inc.**	Fort Worth
85	**Sunshine Mining Co.**	Dallas
255	**Swift Energy Co.**	Houston
108	**Templeton Energy Inc.**	Houston
7	**Tenneco Inc**	Houston
322	**Terrapet Energy Corp.**	Dallas
67	**Tesoro Petroleum Corp.**	San Antonio
4	**Texaco Inc**	White Plains, NY
132	**Texas American Energy Corp.**	Midland, TX
21	**Texas Eastern Corp.**	Houston
95	**Texas Gas Exploration Corp.**	Houston
106	**Texas International Co.**	Oklahoma City
28	**Texas Oil & Gas Corp.**	Dallas
395	**Texas Vanguard Oil Co.**	Austin, TX
225	**Texon Energy Corp.**	Houston
156	**Thermal Exploration Inc.**	Seattle
276	**Thor Energy Resources Inc.**	Tyler, TX
369	**Tide West Oil Co.**	Denver
81	**Tidewater Inc.**	New Orleans
148	**Tipperary Corp.**	Midland, TX
348	**Toklan Oil Corp.**	Tulsa
124	**Tom Brown Inc.**	Midland, TX
80	**Tosco Corp.**	Santa Monica, CA
61	**Total Petroleum (North America) Ltd.**	Denver
382	**TPEX Exploration Inc.**	Golden, CO
372	**Trans Atlantic Resource Corp.**	Tulsa
25	**Transco Energy Co.**	Houston
49	**Transco Exploration Partners Ltd.**	Houston
181	**Tribune/Swab-Fox Cos. Inc.**	Tulsa
123	**Tricentrol PLC**	London, England
202	**Trinity Resources Ltd.**	Houston
113	**Triton Energy Corp.**	Dallas
383	**Tri-Valley Oil & Gas Corp.**	Bakersfield, CA
213	**Tucker Drilling Co. Inc.**	San Angelo, TX
321	**Tyrex Oil Co.**	Casper, WY
82	**UGI Corp.**	Valley Forge, PA
73	**Unimar Corp.**	Tarrytown, NY
41	**Union Texas Petroleum**	Houston
150	**Unit Drilling & Exploration Co.**	Tulsa
115	**Universal Resources Corp.**	Dallas
13	**Unocal Corp.**	Los Angeles
256	**Usenco Inc.**	Midland, TX
301	**U.S. Minerals Exploration Co.**	Arvada, CA
40	**Valero Energy Corp.**	San Antonio
261	**Vermilion Bay Land Co.**	Detroit
125	**Wainoco Oil Corp.**	Houston
162	**Walker Energy Partners**	Houston
317	**Wepco Energy Co.**	Cleveland
221	**Western Energy Development Co.**	Monument, CO
338	**Western Natural Gas Co.**	Dallas
305	**Whiting Petroleum Corp.**	Denver
224	**Wichita Industries Inc.**	Denver
364	**Wicklund Petroleum Corp.**	Oklahoma City
92	**Wicor Inc.**	Milwaukee
367	**Willard Pease Oil & Gas Co.**	Grand Junction, CO
24	**Williams Cos.**	Tulsa
164	**Wilshire Oil Co. of Texas**	Jersey City, NJ
142	**Wiser Oil Co.**	Sistersville, WV
227	**Witco Corp. (Oil & Gas Division)**	New York
130	**Worldwide Energy Corp.**	Denver
380	**Wyoming Oil & Minerals Inc.**	Casper, WY
78	**Yankee Companies Inc.**	Cohasset, MA
375	**Yellowstone Resources Inc.**	Denver
56	**Zapata Corp.**	Houston

The OGJ400 Company Index

Rank by total assets	Company name	Headquarters city
216	**Adams Resources & Energy Inc.**	Houston
87	**Adobe Resources Corp.**	New York
163	**Alamco Inc.**	Clarksburg, WV
336	**Albion International Resources Inc.**	Newport Beach, CA
197	**Alexander Energy Corp.**	Oklahoma City
133	**Allegheny & Western Energy Corp.**	Charleston, WV
291	**Alta Energy Corp.**	Midland, TX
279	**Altex Industries Inc.**	Denver
385	**Amacan Resources Corp.**	Salt Lake City
389	**Amber Resources Co.**	Denver
283	**Amcole Energy Corp.**	Fort Worth
18	**Amerada Hess**	New York
173	**American Exploration Co.**	Houston
222	**American Frontier Exploration Inc.**	Beverly Hills, CA
43	**American Petrofina Inc.**	Dallas
159	**American Quasar Petroleum Co.**	Fort Worth
59	**American Royalty Trust**	Houston
6	**Amoco Corp.**	Chicago
90	**Apache Corp.**	Minneapolis
66	**Apache Petroleum Co.**	Minneapolis
320	**Appalachian Oil & Gas Co. Inc.**	Nashville
236	**Arapaho Petroleum Inc.**	Englewood, CO
346	**Arch Petroleum Inc.**	Fort Worth
166	**Argo Petroleum Corp.**	Santa Monica, CA
251	**Argonaut Energy Corp.**	Irving, TX
45	**Arkla Inc.**	Little Rock
134	**Asamera Inc.**	Calgary, Alberta, Canada
27	**Ashland Oil Inc.**	Ashland, KY
343	**Aspen Exploration Co.**	Denver
8	**Atlantic Richfield Co.**	Los Angeles
311	**Aztec Resources Corp.**	Denver
248	**Barrett Resources Corp.**	Denver
206	**Baruch-Foster Corp.**	Dallas
223	**Basic Earth Science Systems Inc.**	Englewood, CO
302	**Bayou Resources Inc.**	Houston
170	**Beard Oil Co.**	Oklahoma City
366	**Belcor Inc.**	Irvine, CA
204	**Belden & Blake Energy Co.**	North Canton, OH
242	**Bellwether Exploration Co.**	Denver
86	**BHP Petroleum (Americas) Inc.**	Wichita, KS
371	**Big Piney Oil & Gas Co.**	Salt Lake City
392	**Black Giant Oil Co.**	Cisco, TX
332	**Blackgold Energy Resources Inc.**	Englewood, CO
192	**Bogert Oil Co.**	Oklahoma City
381	**Bolyard Oil & Gas Ltd.**	Denver
121	**Bow Valley Petroleum Inc.**	Denver
212	**Bracken Exploration Co.**	Oklahoma City
229	**Brock Exploration Corp.**	New Orleans
391	**Bronco Oil & Gas Co.**	Denver
272	**Burkhart Petroleum Corp.**	Tulsa
318	**Burton/Hawks Inc.**	Casper, WY
47	**Cabot Corp.**	Boston
154	**Callon Petroleum Co.**	Natchez, MS
200	**Calumet Industries Inc.**	Chicago
387	**Calvin Exploration Inc.**	Sante Fe, NM
240	**Cambridge Royalty Co.**	Houston
250	**Cayman Resources Corp.**	Tulsa
55	**Celeron Corp.**	Lafayette, LA
126	**Cenergy Corp.**	Dallas
76	**CENEX (Farmer's Union Central Exchange)**	St. Paul, MN
296	**Centennial Petroleum Inc.**	Denver
34	**Champlin Petroleum Co.**	Fort Worth
257	**Chaparral Resources Inc.**	Denver
158	**Chapman Energy Inc.**	Dallas
3	**Chevron Corp.**	San Francisco
373	**Cheyenne Resources Inc.**	Cheyenne, WY
139	**Chieftain Development Co. Ltd.**	Edmonton, Alberta, Canada
288	**Cibola Energy Corp.**	Albuquerque
333	**Circle Seven Oil & Gas Inc.**	Jacksboro, TX
17	**Coastal Corp.**	Houston
287	**Cobb Resources Corp.**	Albuquerque
344	**Colorado Energy Corp.**	Alsip, IL
19	**Columbia Gas System Inc.**	Wilmington, DE
313	**Columbine Exploration Corp.**	Denver
15	**Conoco Corp.**	Houston
129	**Conquest Exploration Co.**	Houston
29	**Consolidated Natural Gas Co.**	Pittsburgh
128	**Consolidated Oil & Gas Inc.**	Denver
245	**ConVest Energy Corp.**	Houston
165	**ConVest Energy Partners Ltd.**	Houston
295	**Credo Petroleum Corp.**	Denver
340	**Crescent Oil & Gas Corp.**	Denver
94	**Crown Central Petroleum Corp.**	Baltimore
347	**Crown Resource Corp.**	Denver
237	**Crown Zellerbach Corp. (Energy Segment)**	San Francisco
102	**Crystal Oil Co.**	Shreveport, LA
310	**Dallas Oil & Minerals Inc.**	Fort Worth
100	**Damson Oil Corp.**	New York
292	**Deca Energy Corp.**	Denver
184	**Deminex U.S. Oil Co.**	Dallas
105	**Depco Inc. (DeKalb Petroleum Corp.)**	DeKalb, IL
193	**Devon Resource Investors**	Oklahoma City
370	**Diablo Oil Co.**	Denver
23	**Diamond Shamrock Corp.**	Dallas
263	**Dietrich Resources Corp.**	Denver
72	**Diversified Energies Inc.**	Minneapolis
286	**Dorchester Hugoton Ltd.**	Dallas
355	**Double Eagle Petroleum & Mining Co.**	Casper, WY
174	**Drillers Inc.**	Houston
329	**Eagle Exploration Co.**	Denver
376	**EMC Energies Inc.**	Casper, WY
354	**Endevco Inc. (Expl. & Prod. Segment)**	Dallas
275	**Energy Assets International Corp.**	New York
330	**Energy Capital Development Corp.**	Rosslyn, VA
199	**Energy Oil Inc.**	Longmont, CO
394	**Energy Production Co.**	Denver
188	**Energy Ventures Inc.**	Houston
297	**Enex Resources Corp.**	Kingwood, TX
16	**Enron Corp.**	Omaha, NE
32	**Enserch Corp.**	Dallas
122	**Ensource Inc.**	Englewood, CO
153	**Entex Energy Development Ltd.**	Houston
205	**Equitable Petroleum Corp.**	New York
70	**Equitable Resources Inc.**	Pittsburgh
169	**Equity Oil Co.**	Salt Lake City
203	**Ethyl Corp. (Oil & Gas Segment)**	Richmond, VA
207	**Euratex Corp.**	Fort Worth
285	**Evergreen Resources Inc.**	Denver
361	**Exploration Co.**	San Antonio
1	**Exxon Corp.**	New York
315	**Falcon Oil & Gas Co. Inc.**	Odessa, TX
187	**Federated Natural Resources Corp.**	Traverse City, MI
118	**Felmont Oil Corp.**	Stamford, CT
97	**First Mississippi Corp.**	Jackson, MS
151	**Flag-Redfern Oil Co.**	Midland, TX
91	**Forest Oil Corp.**	Denver
309	**Fossil Oil & Gas Inc.**	Oklahoma City
38	**Freeport-McMoRan Inc.**	New Orleans
143	**Freeport-McMoRan Oil & Gas Royalty Trust**	Houston
185	**Fuel Resources Development Co.**	Denver
182	**Fuel Resources Inc.**	Brooklyn, NY
167	**Galaxy Oil Co.**	Wichita Falls, TX
267	**General Hydrocarbons Inc.**	Billings, MT
270	**Geodyne Resources Inc.**	Tulsa
280	**Georesources Inc.**	Williston, ND
293	**Gerber Energy International Inc.**	Denver
48	**Global Marine Inc.**	Houston
149	**Global Natural Resources Inc.**	Houston
282	**Golden Oil Co.**	Denver
386	**Golden Triangle Royalty Co.**	Cisco, TX
53	**Grace Natural Resource Group**	Dallas
141	**Graham-McCormick Oil & Gas Partnership**	Metairie, LA
269	**Great American Partners**	San Diego
353	**Great American Resources Inc.**	San Diego
284	**Great Eastern Energy & Development Corp.**	Englewood, CO
289	**Greenwood Resources Inc.**	Englewood, CO
146	**Hadson Petroleum Corp.**	Oklahoma City
62	**Hamilton Oil Corp.**	Denver
278	**Hanna Petroleum Co.**	Cleveland
209	**Harken Oil & Gas Inc.**	Bedford, TX
84	**Helmerich & Payne Inc.**	Tulsa
300	**Henry Energy Corp.**	Arlington, TX
230	**Hershey Oil Corp.**	Pasadena, CA
235	**High Plains Oil Corp.**	Denver
349	**Hipoint Investments Ltd.**	Oklahoma City
96	**Home Petroleum Corp.**	Denver
246	**Home-Stake Oil & Gas Co.**	Tulsa
239	**Home-Stake Royalty Corp.**	Tulsa
178	**Houston Oil Fields Co.**	Houston
271	**Houston Oil Royalty Trust**	Houston
137	**Houston Oil Trust**	Houston
398	**Houston Oil & Energy Inc.**	Abilene, TX
117	**Howell Corp.**	Houston
339	**Hubco Exploration Inc.**	New Orleans
144	**IMC Exploration Co.**	Houston
365	**Impact Energy Inc.**	Denver
397	**Imperial Energy Corp.**	Denver
77	**Inexco Oil Co.**	Houston
312	**Intercontinental Energy Corp.**	Englewood, CO
352	**Intramerican Oil & Minerals Inc.**	Dallas
234	**Jackson Exploration Inc.**	Dallas
281	**J.M. Resources Inc.**	Denver
111	**Kaiser Energy Inc.**	Oakland, CA
75	**Kaneb Services Inc.**	Sugar Land, TX
351	**Kee Exploration Inc.**	Gillette, WY
147	**Kenai Corp.**	New York
186	**KenCope Energy Cos.**	San Antonio
30	**Kerr-McGee Corp.**	Oklahoma City
253	**Kimbark Oil & Gas Co.**	Denver
119	**Kirby Exploration Co.**	Houston
307	**KRM Petroleum Corp.**	Denver
215	**Leader Development Corp.**	Columbus, OH
83	**Lear Petroleum Corp.**	Dallas
177	**LL&E Royalty Trust**	Houston
378	**Loch Exploration Inc.**	Gainesville, TX
226	**Lomak Petroleum Inc.**	Hartville, OH
52	**Louisiana Land & Exploration Co.**	New Orleans
360	**Love Oil Co. Inc.**	Denver
326	**Lyric Energy Inc.**	Amarillo, TX
195	**MacMillan Ring Free Oil Co. Inc.**	New York
160	**Magic Circle Energy Corp.**	Oklahoma City
46	**Mapco Inc.**	Tulsa
14	**Marathon Oil Co.**	Findlay, OH
135	**Marion Corp.**	Daphne, AL
328	**Marlin Oil Co.**	Denver
175	**May Energy Partners Ltd.**	Dallas
152	**May Petroleum Inc.**	Dallas
179	**Maynard Oil Co.**	Dallas

CRUDE OIL ASSAYS

Key to the assays . . .

Each assay is headed, in the following order, by the official name of the crude, the former or secondary name in parenthesis, the country of origin, and location and type loading facilities. Loading systems that frequently crop up are abbreviated. Those used are CBM (conventional buoy mooring), SPM (single point mooring), SBM (single buoy mooring), CALM (catenary anchor leg mooring), and SALM (single anchor leg mooring).

Mideast

Aboozar (Ardeshir), Iran

Terminal Kharg Island

Crude
Gravity, °API: 26.9
Sulfur, wt %: 2.48
Rvp, psi: 5.5
H_2S (dissolved) wt %: 0.031
H_2S (evolved) wt %: 0.089
Pour pt, °F.: −30
Salt, lb/1,000 bbl: 55.0
Neutralization value, mg KOH/g: 1.96
Rams. carbon, wt %: 5.9
Kin. vis., cSt @ 68° F.: 36.58
@ 122° F.: 12.76
V/Ni, ppm: 71/21
Light hydrocarbons, vol %: 3.86

Naphtha
Range (TBP), °F.: C_5-200
Yield, vol %: 5.5
Gravity, °API: 80.2
Sulfur (total) wt %: 0.090
Mercaptan S, wt %: 0.044
Rvp, psi: 10.3
Paraffins, vol %: 72.6
Naphthenes, vol %: 24.2
Aromatics, vol %: 3.1
RON, clear: 71.7
MON, clear: 67.9

Naphtha
Range (TBP), °F.: 200-320
Yield, vol %: 8.4
Gravity, °API: 55.7
Sulfur (total) wt %: 0.097
Mercaptan S, wt %: 0.027
Rvp, psi: 1.0
P/N/A, vol %: 60.1/27.3/12.7
RON, clear: 45.7
MON, clear: 44.3

Naphtha
Range (TBP), °F.: 320-360
Yield, vol %: 3.8
Gravity, °API: 48.6
Sulfur (total), wt %: 0.158
Mercaptan S, wt %: 0.023
P/N/A, vol %: 59.1/25.8/15.1
RON, clear: 30.2
MON, clear: 31.4

Kerosine
Range (TBP), °F.: 360-520
Yield, vol %: 14.4
Gravity, °API: 41.9
Sulfur (total), wt %: 0.452
Mercaptan S, wt %: 0.015
Aniline pt, °F.: 143.9
Diesel index: 60.2
Cetane index: 49.3
Freeze pt, °F.: −32
Cloud pt, °F.: −49
Pour pt, °F.: −52
Smoke pt, mm: 20

Gas oil
Range (TBP), °F.: 520-650
Yield, vol %: 12.7
Gravity, °API: 33.4
Sulfur (total), wt %: 1.274
Charac. factor: 11.74
Aniline pt, °F.: 158.8
Diesel index: 53.0
Cetane index: 52.7
Cloud pt, °F.: 21
Pour pt, °F.: 18
Vis., SUS @ 100° F.: 40.4
@ 122° F.: 37.1

Residuum
Range (TBP), °F.: 650+
Yield, vol %: 53.5
Gravity, °API: 12.5
Sulfur (total), wt %: 3.804
Pour pt, °F.: 56
Rams. carbon, wt %: 10.0
Vis., SUS @ 122° F.: 12,303.9
@ 210° F.: 465.9
V/Ni, ppm: 120/36

Residuum
Range (TBP), °F.: 1,050+
Yield, vol %: 24.2
Gravity, °API: 3.5
Sulfur (total), wt %: 5.069
Pour pt, °F.: 210
Rams. carbon, wt %: 19.6
Vis., SUS @ 210° F.: 125,012.7
V/Ni, ppm: 244/74

Abu Al Bu Khoosh, Abu Dhabi, U.A.E.

Storage tanker offshore producing area

Crude
Gravity, °API: 31.6
Sulfur, wt %: 2.0
Pour pt, °C.: −12 (−24.5° F.)
Kin. vis., 37.8° C, cSt: 6.7
Con. carbon, wt %: 4.3
Rvp, psi: 3.5
V/Ni, ppm: 12/7
Ibp-15° C. yield, wt %: 0.59
vol %: 0.69

Light naphtha
Range, °C.: 15-65
Yield, wt %: 2.74
vol %: 3.59
Gravity, °API: 88.7
Sulfur, wt %: 0.03
Mercaptans, ppm: 325
Paraffins, vol %: 95
Naphthenes, vol %: 4.4
Aromatics, vol %: 0.06
RON, clear: 74
RON + 3 ml TEL: 94.5

Heavy naphtha
Range, °C.: 65-165
Yield, wt %: 14.45
vol %: 16.83
Gravity, °API: 59.6
Sulfur, wt %: 0.05
Mercaptans, ppm: 276
P/N/A, vol %: 68.3/18.5/13.2

Kerosine
Range, °C.: 165-230
Yield, wt %: 11.52
vol %: 12.53
Gravity, °API: 46.25
Sulfur, wt %: 0.16
Mercaptans, ppm: 182
P/N/A, vol %: 55.5/21.8/22.7
Freezing pt, °C.: −52.5
Aniline pt, °C.: 56.4
Diesel index: 61.7
Smoke pt, mm: 23

Light gas oil
Range, °C.: 230-300
Yield, wt %: 12.5
vol %: 12.96
Gravity, °API: 37.6
Sulfur, wt %: 0.85
Pour pt, °C.: −27
Cloud pt, °C.: −19
Aniline pt, °C.: 65
Diesel index: 55.9
Kin. vis., cSt @ 37.8° C.: 2.63

Heavy gas oil
Range, °C.: 300-375
Yield, wt %: 13.83
vol %: 12.71
Gravity, °API: 30.3
Sulfur, wt %: 1.9
Pour pt, °C.: +2
Cloud pt, °C.: +7
Aniline pt, °C.: 72.2
Diesel index: 49.1
Kin. vis., cSt @ 37.8° C.: 6.92

Distillate
Range, °C.: 375-550
Yield, wt %: 26.63
vol %: 24.95
Gravity, °API: 21.4

Sulfur, wt %: 2.67
Pour pt, °C.: +26
Cloud pt, °C.: +28
Con. carbon, wt %: 0.7
Kin. vis., cSt @ 50° C.: 40.96
@ 98.9° C.: 7.89

Residue
Range, °C.: 375+
Yield, wt %: 45.37
vol %: 40.69
Gravity, °API: 14.9
Sulfur, wt %: 3.4
Pour pt, °C.: +21
Asphaltenes, wt %: 3.1
V/Ni, ppm: 30/14
Kin. vis., cSt @ 50° C.: 435
@ 98.9° C.: 40.3

Residue
Range, °C.: 550+
Yield, wt %: 18.7
vol %: 15.7
Gravity, °API: 4.3
Sulfur, wt %: 4.4
Pour pt, °C.: +50
Asphaltenes, wt %: 9.2
V/Ni, ppm: 67/35
Kin. vis., cSt @ 98.9° C.: 1.860
Pen. at 25° C.: 125

Arabian Heavy (Safaniya), Saudi Arabia

Ras Tanura

Crude
Gravity, °API: 27.9
Sulfur, wt %: 2.85
Pour pt, °F.: −20
Rvp, psi: 7.5
Kin. vis., cSt @ 70° F.: 37.0
@ 100° F.: 19.0

Light naphtha
Range, °FVT: 68-212
Yield, vol %: 7.9
Gravity, °API: 79.9
Sulfur, wt %: 0.0059
Rvp, psi: 8.5
Paraffins, vol %: 88.6
Naphthenes, vol %: 10.2
Aromatics, vol %: 1.2
RON, clear: 58.0

Heavy naphtha
Range, °FVT: 212-302
Yield, vol %: 6.8
Gravity, °API: 60.5
Sulfur, wt %: 0.016
P/N/A, vol %: 70.8/19.5/9.7

Kerosine
Range, °FVT: 302-455
Yield, vol %: 12.4
Gravity, °API: 48.4
Sulfur, wt % 0.16
Aromatics, vol %: 18.9
Freeze pt °F.: −67
Smoke pt, mm: 26
Luminometer no.: 57
Aniline pt, °F.: 141
Kin. vis., cSt @ −30° F.: 5.14
@ 100° F.: 1.14

Light gas oil
Range, °FVT: 455-650
Yield, vol %: 16.5
Gravity, °API: 35.2
Sulfur, wt %: 1.30
Pour pt, °F.: 5
Aniline pt, °F.: 154
Kin. vis., cSt @ 100° F.: 3.45
@ 210° F.: 1.30

Heavy gas oil
Range, °FVT: 650-1,049
Yield, vol %: 30.6
Gravity, °API: 20.9
Sulfur, wt %: 2.92
Pour pt, °F.: 95
Aniline pt, °F.: 173
Kin. vis., cSt @ 100° F.: 77.0
@ 210° F.: 8.46

Residual oil
Range, °FVT: 650+
Yield, vol %: 53.8
Gravity, °API: 12.6
Sulfur, wt %: 4.34
Pour pt, °F.: 60
Con. carbon, wt %: 13.3
Kin. vis., cSt @ 100° F.: 4,103
@ 210° F.: 94.2

Residual oil
Range, °FVT: 1,049+
Yield, vol %: 23.2
Gravity, °API: 3.0
Sulfur, wt %: 6.0
Pour pt, °F.: 120+
Con. carbon, wt %: 27.7
Kin. vis., cSt @ 210° F.: 55,292
Furol, sec @ 275° F.: 1,309
V/Ni/Fe, ppm: 205/64/30

Arabian Light, Saudi Arabia

Ras Tanura and Yanbu also Sidon, Lebanon

Crude
Gravity, °API: 33.4
Sulfur, wt %: 1.79
Pour pt, °F.: −30
Rvp, psi: 3.6
Kin. vis., cSt @ 70° F.: 10.2
@ 100° F.: 6.25

Light naphtha
Range, °FVT: 68-212
Yield, vol %: 8.9
Gravity, °API: 78.4
Sulfur, wt %: 0.024
Rvp, psi: 8.2
Paraffins, vol %: 86.8
Naphthenes, vol %: 10.7
Aromatics, vol %: 2.5
RON, clear: 55.0

Heavy naphtha
Range, °FVT: 212-302
Yield, vol %: 8.5
Gravity, °API: 59.3
Sulfur, wt %: 0.027
P/N/A, vol %: 68.3/19.0/12.7

Kerosine
Range, °FVT: 302-455
Yield, vol %: 16.5
Gravity, °API: 48.0
Sulfur, wt %: 0.084
Aromatics, vol %: 20.6
Freeze pt, °F.: −71
Smoke pt, mm: 23
Luminometer no.: 51
Aniline pt, °F.: 138
Kin. vis., cSt @ −30° F.: 5.39
@ 100° F.: 1.13

Light gas oil
Range, °FVT: 455-650
Yield, vol %: 19.7
Gravity, °API: 36.5
Sulfur, wt %: 1.03
Pour pt, °F.: 5
Aniline pt, °F.: 158
Kin. vis., cSt @ 100° F.: 3.35
@ 210° F.: 1.30

Heavy gas oil
Range, °FVT: 650-1,049
Yield, vol %: 29.8
Gravity, °API: 22.9
Sulfur, wt %: 2.41
Pour pt, °F.: 95
Aniline pt, °F.: 180
Kin. vis., cSt @ 100° F.: 55.5
@ 210° F.: 6.89

Residual oil
Range, °FVT: 650+
Yield, vol %: 44.6
Gravity, °API: 17.2
Sulfur, wt %: 3.1
Pour pt, °F.: 35
Con. carbon, wt %: 7.6
Kin. vis., cSt @ 100° F.: 414.3
@ 210° F.: 24.2

Residual oil
Range, °FVT: 1,049+
Yield, vol %: 14.8
Gravity, °API: 6.9
Sulfur, wt %: 4.34
Pour pt, °F.: 115
Con. carbon, wt %: 20.3
Kin. vis., cSt @ 210° F.: 1,589
Furol, sec @ 275° F.: 104
V/Ni/Fe, ppm: 116/25/114

Arabian Light (Berri), Saudi Arabia

Ras Tanura

Crude
Gravity, °API: 37.8
Sulfur, wt %: 1.19
Pour pt, °F.: −25
Rvp, psi: 4.0
Kin. vis., cSt @ 70° F.: 5.80
@ 100° F.: 3.86

Light Naphtha
Range, °FVT: 68-212
Yield, vol %: 10.1
Gravity, °API: 78.4
Sulfur, wt %: 0.071
Rvp, psi: 6.9
Paraffins, vol %: 87.4
Naphthenes, vol %: 11.2
Aromatics, vol %: 1.4
RON, clear: 50.0

Heavy naphtha
Range, °FVT: 212-302
Yield, vol %: 8.7
Gravity, °API: 58.2
Sulfur, wt %: 0.053
P/N/A, vol %: 65.3/20.4/14.3

Kerosine
Range, °FVT: 302-455
Yield, vol %: 18.7
Gravity, °API: 48.4
Sulfur, wt %: 0.090
Aromatics, vol %: 19.9
Freeze pt, °F.: −71
Smoke pt, mm: 25
Luminometer no.: 54
Aniline pt, °F.: 136
Kin. vis., cSt @ −30° F.: 4.79
@ 100° F.: 1.10

Light gas oil
Range, °FVT: 455-650
Yield, vol %: 21.2
Gravity, °API: 37.3
Sulfur, wt %: 0.72
Pour pt, °F.: 10
Aniline pt, °F.: 161
Kin. vis., cSt @ 100° F.: 3.4
@ 210° F.: 1.28

Heavy gas oil
Range, °FVT: 650-1,049
Yield, vol %: 30.3
Gravity, °API: 25.1
Sulfur, wt %: 1.83
Pour pt, °F.: 95
Aniline pt, °F.: 192
Kin. vis., cSt @ 100° F.: 44.4
@ 210° F.: 6.25

Residual oil
Range, °FVT: 650+
Yield, vol %: 39.3
Gravity, °API: 21.6
Sulfur, wt %: 2.09
Pour pt, °F.: 70
Con. carbon, wt %: 4.2
Kin. vis., cSt @ 100° F.: 128.1
@ 210° F.: 12.34

Residual oil
Range, °FVT: 1,049+
Yield, vol %: 9.0
Gravity, °API: 11.0
Sulfur, wt %: 2.88
Pour pt, °F.: 80
Con. carbon, wt %: 16.2
Kin. vis., cSt @ 210° F.: 396.9
Furol, sec @ 275° F.: 38.2
V/Ni, ppm: 9/6
Aromatics, ppm: 46

Arabian Medium (Khursaniyah), Saudi Arabia

Ras Tanura

Crude
Gravity, °API: 30.8
Sulfur, wt %: 2.40
Pour pt, °F.: +5
Rvp, psi: 3.2
Kin. vis., cSt @ 70° F.: 16.2
@ 100° F.: 9.41

Light naphtha
Range, °FVT: 68-212
Yield, vol %: 8.9
Gravity, °API: 77.7
Sulfur, wt %: 0.043
Rvp, psi: 7.9
Paraffins, vol %: 85.3
Naphthenes, vol %: 12.3
Aromatics, vol %: 2.4
RON, clear: 54.5

Heavy naphtha
Range, °FVT: 212-302
Yield, vol %: 7.7
Gravity, °API: 59.1
Sulfur, wt %: 0.050
P/N/A, vol %: 68.5/18.8/12.7

Kerosine
Range, °FVT: 302-455
Yield, vol %: 14.5
Gravity, °API: 48.0
Sulfur, wt %: 0.14
Aromatics, vol %: 20.6
Freeze pt, °F.: −62
Smoke pt, mm: 23
Luminometer no.: 52
Aniline pt, °F.: 136
Kin. vis., cSt @ −30° F.: 5.10
@ 100° F.: 1.13

Light gas oil
Range, °FVT: 455-650
Yield, vol %: 18.1
Gravity, °API: 36.0
Sulfur, wt %: 1.24
Pour pt, °F.: 15
Aniline pt, °F.: 157
Kin. vis., cSt @ 100° F.: 3.53
@ 210° F.: 1.32

Heavy gas oil
Range, °FVT: 650-1,049
Yield, vol %: 30.9
Gravity, °API: 21.9
Sulfur, wt %: 2.91
Pour pt, °F.: 100
Aniline pt, °F.: 176
Kin. vis., cSt @ 100° F.: 49.2
@ 210° F.: 6.40

Residual oil
Range, °FVT: 650+
Yield, vol %: 49.6
Gravity, °API: 15.0
Sulfur, wt %: 3.90
Pour pt, °F.: 55
Con. carbon, wt %: 9.9
Kin. vis., cSt @ 100° F.: 850
@ 210° F.: 36.0

Residual oil
Range, °FVT: 1,049+
Yield, vol %: 18.7
Gravity, °API: 4.9
Sulfur, wt %: 5.35
Pour pt, ° F.: 115
Con. carbon, wt %: 23.3
Kin. vis., cSt @ 210° F.: 3,847
Furol, sec @ 275° F.: 226
V/Ni/Fe, ppm: 96/32/30

Arabian Medium (Zuluf/Marjan), Saudi Arabia

Juayma

Crude
Gravity, °API: 31.1
Sulfur, wt %: 2.48
Pour pt, °F.: −20
Rvp, psi: 8.3
Kin. vis., cSt @ 70° F.: 19.4
@ 100° F.: 11.01

Light naphtha
Range, °FVT: 68-212
Yield, vol %: 8.9
Gravity, °API: 79.7
Sulfur, wt %: 0.0069
Rvp, psi: 9.1
Paraffins, vol %: 89.3
Naphthenes, vol %: 9.6
Aromatics, vol %: 1.1
RON, clear: 58.6

Heavy naphtha
Range, °FVT: 212-302
Yield, vol % on crude: 8.2
Gravity, °API: 60.2
Sulfur, wt %: 0.024
P/N/A, vol %: 69.3/20.2/10.5

Kerosine
Range, °FVT: 302-455
Yield, vol %: 14.1
Gravity, °API: 48.3
Sulfur, wt %: 0.14
Aromatics, vol %: 17.2
Freeze pt, °F.: −72
Smoke pt, mm: 26
Luminometer no.: 59
Aniline pt, °F.: 139
Kin. vis., cSt @ −30° F.: 5.01
@ 100° F.: 1.13

Light gas oil
Range, °FVT: 455-650
Yield, vol %: 17.6
Gravity, °API: 36.1
Sulfur, wt %: 1.25
Pour pt, °F.: 10
Aniline pt, °F.: 158
Kin. vis., cSt @ 100° F.: 3.45
@ 210° F.: 1.31

Heavy gas oil
Range, °FVT: 650-1,049
Yield, vol %: 28.2
Gravity, °API: 21.8
Sulfur, wt %: 2.90
Pour pt, °F.: 95
Aniline pt, °F.: 177
Kin. vis., cSt @ 100° F.: 72.6
@ 210° F.: 8.04

Residual oil
Range, °FVT: 650+
Yield, vol %: 48.0
Gravity, °API: 13.9
Sulfur, wt %: 4.06
Pour pt, ° F.: 55
Con. carbon, wt %: 9.4
Kin. vis., cSt @ 100° F.: 2,126
@ 210° F.: 65.9

Residual oil
Range, °FVT: 1,049+
Yield, vol %: 19.8
Gravity, °API: 3.9
Sulfur, wt %: 5.51
Pour pt, ° F.: 140
Con. carbon, wt %: 20.5
Kin. vis., cSt @ 210° F.: 20,085
Furol, sec @ 275° F.: 684
V/Ni/Fe, ppm: 179/54/40

Bahrgansar/Nowruz (SIRIP Blend), Iran

Ras Bahrgan SBM

Crude
Gravity, °API: 27.1
Sulfur, wt %: 2.45
Pour pt, °C.: −33
Vis., cSt @ 100° F.: 20.4
Con. carbon, wt %: 7.9
Rvp, kg/sq cm: 0.56
Salt, lb/1,000 bbl: 30.6
V/Ni, ppm: 72/25

Light naphtha
Range, °C.: C_5-66
Yield, wt %: 3.76
Gravity, °API: 84.3
Sulfur, wt %: 0.065
Rvp, kg/sq cm: 0.87
Paraffins, vol %: 92.3
Naphthenes, vol %: 6.3
Aromatics, vol %: 1.4
RON, clear: 67.4

Heavy naphtha
Range, °C.: 66-150
Yield, wt %: 8.59
Gravity, °API: 59.6
Sulfur, wt %: 0.06
P/N/A, vol %: 60.0/31.0/9.0
RON, clear: 48.0

Kerosine
Range, °C.: 150-250
Yield, wt %: 13.23
Gravity, °API: 46.0
Sulfur, wt %: 0.228
Aromatics, vol %: 18.5
Freezing pt, °C.: < −55
Smoke pt, mm: 22
Aniline pt, °C.: 59.8

Gas oil
Range, °C.: 250-350
Yield, wt %: 14.04
Gravity, °API: 33.6
Sulfur, wt %: 1.19
Pour pt, °C.: −12
Aniline pt, °C.: 69.2
Diesel index: 53.0

Residual oil
Range, °C.: 350+
Yield, wt %: 59.00
Gravity, °API: 11.3
Sulfur, wt %: 3.8
Pour pt, °C.: +12
Con. carbon, wt %: 13.35

Residual oil
Range, °C.: 550+
Yield, wt %: 35.90
Gravity, °API: 4.4
Sulfur, wt %: 4.84
Pour pt, °C.: > +48
Con. carbon, wt %: 21.85
V/Ni/Fe, ppm: 202/69/52

Note: Same assay first published in 1976.

Basrah Heavy, Iraq

Mina al Bakr sea terminal in Persian Gulf (Khor al Khafja)

Crude
Gravity, °API: 24.7
Sulfur, wt %: 3.5
Pour pt, °C.: −30
Kin. vis. @ 10° C., cSt: 86.3
C_4 & lighter, wt %: 0.8

Light SR naphtha
Range, °C.: C_5-65
Yield, wt %: 2.6
Density @ 15° C., g/cu m: 0.648
RON + 0.4 g Pb/l: 83

Heavy SR naphtha
Range, °C.: 65-175
Yield, wt %: 12.2
Density @ 15° C., g/cu m: 0.74
RON + 0.4 g Pb/l: 55
Aromatics, vol %: 9.5
Naphthenes, vol %: 21

Kerosine
Range, °C.: 175-222
Yield, wt %: 6.9
Density @ 15° C., g/cu m: 0.799
Sulfur, wt %: 0.38

Gas oil
Range, °C.: 225-360
Yield, wt %: 21.6
Density @ 15° C., g/cu m: 0.871
Sulfur, wt %: 1.95
Pour pt, °C.: −16
Cold filter pour pt, °C.: −14
Kin. vis., cSt @ 100° C.: 1.42

Heavy gas oil
Range, °C.: 360-460
Yield, wt %: 13.5
Density @ 15° C., g/cu m: 0.935
Sulfur, wt %: 3.57
Kin. vis., cSt @ 100° C.: 5.20

Long residuum
Range, °C.: 360+
Yield, wt %: 55.9
Density @ 15° C., g/cu m: 1.012
Sulfur, wt %: 5.25
Kin. vis., cSt @ 100° C.: 178.2

Short residuum
Range, °C.: 460+
Yield, wt %: 42.4
Density @ 15° C., g/cu m: 1.041
Sulfur, wt %: 5.80
Kin. vis., cSt @ 100° C.: 1,350
Con. carbon, wt %: 22.0
V/Ni, ppm: 212/26
Pen. @ 25° C., 0.1 mm: 180

Basrah Light, Iraq

Marine pipeline to Khor-al-Amaya piled structure in gulf

Crude
Gravity, °API: 33.7
Sulfur, wt %: 1.95
Pour pt, °C.: −15
Kin. vis., cSt @ 10° C.: 15.0
C_4 & lighter, wt %: 1.3

Light SR naphtha
Range, °C.: C_5-65
Yield, wt %: 3.7
Density @ 15° C., g/cu m: 0.646
RON + 0.4 g Pb/l: 83

Heavy SR naphtha
Range, °C.: 65-175
Yield, wt %: 16.2
Density @ 15° C., g/cu m: 0.737
RON + 0.4 g Pb/l: 54
Aromatics, vol %: 10
Naphthenes, vol %: 17

Kerosine
Range, °C.: 175-225
Yield, wt %: 8.2
Density @ 15° C., g/cu m: 0.795
Sulfur, wt %: 0.10

Gas oil
Range, °C.: 225-360
Yield, wt %: 22.9
Density @ 15° C., g/ cu m: 0.843
Sulfur, wt %: 1.20
Pour pt, °C.: −12
CFPP, °C.: −9
Kin. vis., cSt @ 100° C.: 1.35

Heavy gas oil
Range, °C.: 360-525
Yield, wt %: 25.1
Density @ 15° C., g/cu m: 0.916
Sulfur, wt %: 2.41
Kin. vis., cSt @ 100° C.: 8.00

Long residuum
Range, °C.: 360+
Yield, wt %: 47.7
Density @ 15° C., g/cu m: 0.966
Sulfur, wt %: 3.60
Kin. vis., cSt @ 100° C.: 38.5

Short residuum
Range, °C.: 525+
Yield, wt %: 22.6
Density @ 15 °C., g/cu m: 1.020
Sulfur, wt %: 4.70
Kin. vis., cSt @ 100 °C.: 760
Con. carbon, wt %: 18.5
V/Ni, ppm: 80/22

Basrah Medium, Iraq

Mina-al-Bakr sea terminal in Persian Gulf (Khor al Khafja)

Crude
Gravity, °API: 31.1
Sulfur, wt %: 2.58
Pour pt, °C.: −30
Kin. vis., cSt @ 10° C.: 41.0
C_4 & lighter, wt %: 1.6

Light SR naphtha
Range, °C.: C_5-65
Yield, wt %: 3.3
Density, 15° C., g/cu m: 0.64
RON + 0.4, g Pb/l: 80

Heavy SR naphtha
Range, °C.: 65-175
Yield, wt %: 14.9
Density @ 15° C., g/cu m: 0.736
RON + 0.4 g Pb/l: 54
Aromatics, vol %: 10.0
Naphthenes, vol %: 17

Kerosine
Range, °C.: 175-225
Yield, wt %: 7.5
Density @ 15° C., g/cu m: 0.793
Sulfur, wt %: 0.23

Gas oil
Range, °C.: 225-360
Yield, wt %: 22.3
Density @ 15° C., g/cu m: 0.849
Sulfur, wt %: 1.57
Pour pt, °C.: −13
CFPP, °C.: −10
Kin. vis., cSt @ 100° C.: 1.44

Heavy gas oil
Range, °C.: 360-520
Yield, wt %: 21.9
Density @ 15° C., g/cu m: 0.931
Sulfur, wt %: 3.08
Kin. vis., cSt @ 100 ° C.: 8.74

Long residuum
Range, °C.: 360+
Yield, wt %: 50.4
Density @ 15° C., g/cu m: 0.984
Sulfur, wt %: 4.38
Kin. vis., cSt @ 100° C.: 61.7

Short residuum
Range, °C.: 520+
Yield, wt %: 28.5
Density @ 15° C., g/cu m: 1.032
Sulfur, wt %: 5.43
Kin. vis., cSt @ 100° C.: 1,400
Con. carbon, wt %: 19.0
V/Ni, ppm: 175/63
Pen. @ 25° C., 0.1 mm: 180

Belayim, Egypt

Wadi el Feiran, Gulf of Suez

Crude
Gravity, °API: 27.5
Sulfur, wt %: 2.20
Vis., cSt @ 20° C.: 51.27
Pour pt, °C.: +6
Wax content, wt %: 8.0
Rvp, psi: 6.50
Carbon residue, wt %: 7.25
V/Ni, ppm: 79.4/54.6
C_1-C_4, yield, vol %: 2.43

Naphtha
Range, °C.: C_5-82
Yield, vol %: 5.12
RON, clear: 67.0
Ron + 0.4 Pb/l: 80.8

Naphtha
Range, °C.: 82-160
Yield, vol %: 10.15
Paraffins, vol %: 57.0
Napthenes, vol %: 33.0
Aromatics, vol %: 10.0
RON, clear: 47.2

Kerosine
Range, °C.: 160-230
Yield, vol %; 9.36
Gravity, °API: 45.4
Total sulfur, wt %: 0.36
Smoke pt, mm: 24
Aromatics, vol %: 16.7

Gas oil
Range, °C.: 230-350
Yield, vol %: 18.49
Gravity, °API: 34.0
Total sulfur, wt %: 1.47
Vis., cSt @ 20° C.: 6.532
Pour pt, °C: −7
Aniline pt, °C.: 69.2
Diesel index: 53.2

Vacuum distillate
Range, °C.: 350-550
Yield, vol %: 26.94
Gravity, °API: 23.2
Total sulfur, wt %: 2.19
Vis., cSt @ 50° C.: 36.24
Pour pt, °C.: +39
Carbon residue, wt %: 0.65
Basic N, ppm: 540
Total N, ppm: 1,813

Residue
Range, °C.: 350+
Yield, vol %: 54.45
Gravity, °API: 13.5
Total sulfur, wt %: 3.12
Vis., cSt @ 50° C.: 1,508
Pour pt, °C.: +30
Wax content, wt %: 13.7
Carbon residue, wt %: 12.10
V/Ni, ppm: 133.1/91.5

Burgan (Wafra), Divided Zone

Mina Saud, Divided Zone CBM, also Mina Abdulla, Kuwait

Crude
Gravity, °API: 23.3
Sulfur, wt %: 3.37
Pour pt, °F.: −5
Vis., Saybolt @ 122° F.: 134
Con. carbon, wt %: 7.7
Rvp, psi: 3.4
Salt content, lb/1,000 bbl: 17.5
V/Ni, ppm: 34/6.8

Light naphtha
Range, °F.: IBP-200
Yield, vol %: 3.20
Gravity, °API: 77.5
Sulfur, wt %: 0.01
Rvp, psi: 9.6
Paraffins, vol %: 74
Naphthenes, vol %: 25
Aromatics, vol %: 1
RON, clear: 73.1

Heavy naphtha
Range, °F.: 200-435
Yield, vol %: 13.62
Gravity, °API: 49.8
Sulfur, wt %: 0.15
Rvp, psi: 0.2
P/N/A, vol %: 44/36/20
RON, clear: 52.0
RON, + 3 g TEL: 68.0

Kerosine
Range, °F.: 435-500
Yield, vol %: 6.70
Gravity, °API: 38.5
Sulfur, wt %: 0.76
Aromatics, vol %: 37
Freezing pt, °F.: −47
Smoke pt, mm: 18
Aniline pt, °F.: 137.7
Cetane index: 47.3
ASTM, 50% pt, °F.: 456

Gas oil
Range, °F.: 500-620
Yield, vol %: 12.63
Gravity, °API: 32.7
Sulfur, wt %: 1.76
Pour pt, °F.: −5
Aniline pt, °F.: 153.3
Cetane index: 52.0

Residual oil
Range, °F.: 620+
Yield, vol %: 63.45
Gravity, °API: 13.2
Sulfur, wt %: 4.45
Pour pt, °F.: +60
Con. carbon, wt %: 1.5

Residual oil
Range, °F.: 1,048+
Yield, vol %: 34.23
Gravity, °API: 6.2
Sulfur, wt %: 5.43
Con. carbon, wt %: 20.3
V/Ni, ppm: 120/25

Dorrood (Darius), Iran

Kharg Island

Crude
Gravity, °API: 33.6
Sulfur, wt %: 2.35
Rvp, psi: 6.5
H_2S (evolved), wt %: 0.026
Pour pt, °F.: −4.5
Rams. carbon, wt %: 4.6
Kin. vis., cSt @ 100° F.: 5.65
V/Ni, ppm: 23/8
C_1-C_5, vol %: 6.35

Naphtha
Range (TBP), °F.: C_5-200
Yield, vol %: 10.1
Gravity, °API: 81.9
Sulfur, wt %: 0.067
Charac. factor: 12.70
Paraffins, vol %: 85.6
Naphthenes, vol %: 12.2
Aromatics, vol %: 2.2
RON/MON, clear: 61.7/61.1

Naphtha
Range (TBP), °F.: 200-320
Yield, vol %: 12.7
Gravity, °API: 59.0
Sulfur, wt %: 0.088
Charac. factor: 12.07
P/N/A, vol %: 67.5/17.8/14.8
RON/MON, clear: 33.0/ 35.9

Kerosine
Range, °F.: 320-520
Yield, vol %: 18.6
Gravity, °API: 44.9
Sulfur, wt %: 0.462
Charac. factor: 11.88
Aniline pt, °F.: 142.9
Diesel index: 64.1
Cetane index: 46.3
Freeze pt, °F.: −41
Cloud pt, °F.: −44
Pour pt, °F.: −49
Smoke pt, mm: 24
Naphthalenes, vol %: 2.66
Neut. no., mg Kott/g: 0.20
Vis., SUS @ 68° F.: 32.7

Gas oil
Range, °F.: 520-650
Yield, vol %: 11.5
Gravity, °API: 33.7
Sulfur, wt %: 1.68
Charac. factor: 11.76
Aniline pt, °F.: 162.3
Diesel index: 54.6
Cetane index: 49.9
Cloud pt, °F.: 26
Pour pt, °F.: 21
Vis., SUS @ 68° F.: 47.0

Residuum
Range, °F.: 650+
Yield, vol %: 44.6
Gravity, °API: 14.5
Sulfur, wt %: 3.97
Pour pt: °F.: 58
Rams. carbon, wt %: 9.10
Vis., SUS @ 122° F.: 1,494.0
V/Ni, ppm: 45/16

Residuum
Range, °F.: 1,050+
Yield, vol %: 17.9
Gravity, °API: 3.8
Sulfur, wt %: 5.38
Pour pt, °F.: 141
V/Ni, ppm: 101/36

Dubai (Fateh), Dubai, U.A.E.

SBMs in offshore Persian Gulf producing area

Crude
Gravity, °API: 31.05
Total sulfur, wt %: 2.0
Kin. vis., cSt @ 20° C.: 12.82
@ 40° C.: 7.05
Rvp, bar: 0.419
Pour pt, °C.: −9
Asphaltenes, wt %: 1.70
Con. carbon, wt %: 4.62
V/Ni, ppm: 42/14

Debutanized naphtha
Range, °C.: 15-145
Yield, vol %: 16.4
Gravity °API: 75.0
Vol % position in crude: 2.0-18.4
Total sulfur, ppm: 193
Rvp, bar: 0.44
Paraffins, vol %: 68.4
Naphthenes, vol %: 23.1
Aromatics, vol %: 8.5
RON, clear: 55.6

Kerosine
Range, °C.: 145-230
Yield, vol %: 15.0
Total sulfur, wt %: 0.25
P/N/A, vol %: 50.9/29.9/19.2
Smoke pt, mm: 22
Aniline pt, °C.: 56.0
Diesel index: 62.1
Cetane index: 56.0

Gas oil
Range, °C.: 145-350
Yield, vol %: 36.6
Gravity, °API: 38.6
Total sulfur, wt %: 1.04
Kin. vis., cSt @ 20° C.: 3.02
@ 40° C.: 1.99
Aniline pt, °C.: 60.8
Diesel index: 54.6
Cetane index: 51.0

Gas oil
Range, °C.: 175-400
Yield, vol %: 39.9
Gravity, °API: 34.1
Total sulfur, wt %: 1.43
UOP factor: 11.65

Residue
Range, °C.: 350+
Yield, vol %: 45.0
Gravity, °API: 14.75
Total sulfur, wt %: 3.0
Kin. vis., cSt @ 50° C.: 351
@ 100° C.: 31.0
Pour pt, °C.: +19
Con. carbon, wt %: 9.1
V/Ni, ppm: 85/27

Dukhan (Qatar Land), Qatar

Umm Said terminal CBM & SBM

Crude
Gravity, °API: 41.7
Sulfur, wt %: 1.28
H_2S g/100 cc: 0.0283
Pour pt, °F.: −20
Rvp, psi: 11.7
Vis., SSU @ 80° F.: 43.3

Gasoline
Range, °F.: 40-155
Yield, vol %: 8.61
Gravity, °API: 86.5
Sulfur, wt %: 0.02
Paraffins, vol %: 95.0
Naphthenes, vol %: 3.9
Aromatics, vol %: 1.1

Light naphtha
Range, °F.: 155-265
Yield, vol %: 11.74
Gravity, °API: 64.3
Sulfur, wt %: 0.02
P/N/A, vol %: 67.8/19.7/12.5

Heavy naphtha
Range, °F.: 265-350
Yield, vol %: 10.65
Gravity, °API: 52.5
Sulfur, wt %: 0.03

P/N/A, vol %: 64.3/13.9/21.1
Dinaphthenes, vol %: 0.7
Smoke pt, calculated: 22.6

Kerosine
Range, °F.: 350-500
Yield, vol %: 15.83
Gravity, °API: 45.0
Cetane index (calculated): 51.1
Sulfur, wt %: 0.14
Aromatics, vol %: 21.1
Smoke pt: 21.0
Freeze pt, °F.: −42
Pour pt, °F.: −45

Heavy gas oil
Range, °F.: 500-650
Yield, vol %: 15.14
Cetane index (calculated): 55.1
Sulfur, wt %: 1.11
Total N, ppm: 35
Chloride, ppm: < 5.0
Pour pt, °F.: 15

Residue
Range, °F.: 650+
Yield, vol %: 32.66
Gravity, °API: 20.3
Sulfur, wt %: 2.58
Vis., SSU @ 210° F.: 73.2

Residue
Range, °F.: 650-1,000
Yield, vol %: 22.79
Gravity, °API: 24.1
Sulfur, wt %: 2.15
Total N, ppm: 525
Rams. carbon, wt %: 0.23
Vis., SSU @ 210° F.: 46.0

Pitch
Range, °F.: 1,000+
Yield, vol %: 9.87
Sulfur, wt %: 3.45
Con. carbon, wt %: 12.75
V/Ni, ppm: 19/3

Eocene (Wafra), Divided Zone

Mina Saud, Divided Zone CBM, also Mina Abdulla, Kuwait

Crude
Gravity, °API: 18.6
Sulfur, wt %: 4.55
Pour pt, °F.: −20
Vis., Saybolt 122° F.: 80.4
Con. carbon, wt %. 8.9
Rvp, psi: 1.1
Salt content, lb/1,000 bbl: 7.0

Light naphtha
Range, °F.: Ibp-200
Yield, vol %: 1.50
Gravity, °API: 77.6
Sulfur, wt %: 0.12
Rvp, psi: 11.4
Paraffins, vol %: 70
Naphthenes, vol %: 29
Aromatics, vol %: 1
RON, clear: 78.0
ASTM, 50% pt, °F.: 154

Heavy naphtha
Range, °F.: 200-435
Yield, vol %: 11.82
Gravity, °API: 51.0
Sulfur, wt %: 0.27
Rvp, psi: 1.4
P/N/A, vol %: 45/40/15
RON, clear: 48
RON, 3 g TEL: 60
ASTM, 50% pt, °F.: 325

Kerosine
Range, °F.: 435-500
Yield, vol %: 5.97
Gravity, °API: 36.9
Sulfur, wt %: 1.0
Aromatics, vol %: 30
Freezing pt, °F.: −66
Smoke pt, mm: 17
Aniline pt, °F.: 133.2
Cetane index: 43
ASTM, 50% pt, °F.: 458

Gas oil
Range, °F.: 500-620
Yield, vol %: 11.15
Gravity, °API: 31.0
Sulfur, wt %: 1.80
Pour pt, °F.: −30
Aniline pt, °F.: 145.8
Cetane index: 47
ASTM, 50% pt, °F.: 562

Residual oil
Range, °F.: 620+
Yield, vol %: 68.03
Gravity, °API: 10.0
Sulfur, wt %: 4.9
Pour pt, °F.: 60
Con. carbon, wt %: 14.83

Residual oil
Range, °F.: 1,044+
Yield, vol %: 39.75
Gravity, °API: 4.6
Sulfur, wt %: 6.1
Con. carbon, wt %: 22.5
V/Ni, ppm: 135/67

Foroozan (Fereidoon), Iran

Kharg Island

Crude
Gravity, °API: 31.3
Sulfur, wt %: 2.50
Rvp, psi: 5.7
H_2S (evolved), wt %: 0.015
Pour pt, °F.: −35
Neut. no., mg KOH/g: 0.70
Rams. carbon, wt %: 5.4
Kin. vis., cSt @ 68°F.: 15.33
V/Ni, ppm: 36/11
C_1-C_5, vol %: 6.35

Naphtha
Range, °F.: C_5-200
Yield, vol %: 9.9
Gravity, °API: 82.6
Sulfur, wt %: 0.017
Charac. factor: 12.72
Paraffins, vol %: 76.8
Naphthenes, vol %: 21.8
Aromatics, vol %: 1.4
RON/MON, clear: 64.3/62.6

Naphtha
Range, °F.: 200-320
Yield, vol %: 10.5
Gravity, API: 58.1
Sulfur, wt %: 0.056
Charac. factor: 12.02
P/N/A, vol %: 71.6/17.2/11.3
RON/MON, clear: 30.2/32.0

Kerosine
Range, °F.: 320-520
Yield, vol %: 17.7
Gravity, °API: 44.3
Sulfur, wt %: 0.435
Charac. factor: 11.84
Aniline pt, °F.: 145.2
Diesel index, °F.: 64.3
Cetane index: 45.4
Freeze pt, °F.: −41
Cloud pt, °F.: −52
Pour pt, °F.: −52
Smoke pt, mm: 22
Vis., SUS @ 68° F.: 32.4

Gas oil
Range, °F.: 520-650
Yield, vol %: 10.8
Gravity, °API: 33.4
Sulfur, wt %: 1.56
Charac. factor: 11.74
Aniline pt, °F.: 161.2
Diesel index: 53.8
Cetane index: 49.4
Cloud pt, °F.: 20
Pour pt, °F.: 19
Vis., SUS @ 68° F.: 48.0

Residuum
Range, °F.: 650+
Yield, vol %: 48.8
Gravity, °API: 13.6
Sulfur, wt %: 4.13
Pour pt, °F.: 34
Rams. carbon, wt %: 9.86
Vis., SUS @ 122 °F.: 3,516.0
V/Ni, ppm: 66/20

Residuum
Range, °F.: 1,050+
Yield, vol %: 20.4
Gravity, °API: 3.8
Sulfur, wt %: 5.6
Pour pt, °F.: 158
V/Ni, ppm: 143/44

Gulf of Suez Mix, Egypt

Ras Shukheir/3 conventional sea berths

Crude
Gravity, °API: 31.9
Sulfur, wt %: 1.52
Rvp, psi: 8.3
Pour pt, °F.: 35
Rams. carbon, wt %: 4.4
Kin. vis., cSt @ 100° F.: 8.74
V/Ni, ppm: 41/25
C_1-C_5, vol % yield: 5.48

Naphtha
Range (TBP), °F.: C_5-200
Yield, vol %: 7.8
Gravity, °API: 79.1
Total sulfur, wt %: 0.018
Rvp, psi: 10.7
Paraffins, vol %: 80.0
Naphthenes, vol %: 18.0
Aromatics, vol %: 2.0
RON, clear: 69.4
MON, clear: 66.1

Naphtha
Range (TBP), °F.: 200-320
Yield, vol %: 10.0
Gravity, °API: 56.7
Total sulfur, wt %: 0.022
Rvp, psi: 1.1
P/N/A, vol %: 57.3/32.7/10.1
RON, clear: 47.2
MON, clear: 43.9

Kerosine
Range (TBP), °F.: 320-520
Yield, vol %: 17.7
Gravity, °API: 42.6
Total sulfur, wt %: 0.395
Aniline pt, °F.: 138.6
Diesel index: 59.1
Cetane index: 43.0
Freeze pt, °F.: −48
Cloud pt, °F.: −42
Smoke pt, mm: 26
Naphthalenes, vol %: 2.88

Gas oil
Range (TBP), °F.: 520-650
Yield, vol %: 11.3
Gravity, °API: 33.9
Total sulfur, wt %: 1.2
Aniline pt, °F.: 159.1
Diesel index: 53.9
Cetane index: 50.21
Cloud pt, °F.: 26
Vis., SUS @ 68° F.: 49.8

Gas oil
Range (TBP), °F.: 650-850
Yield, vol %: 17.2
Gravity, °API: 27.2
Total sulfur, wt%: 1.6
Rams. carbon, wt %: 0.34

Residuum
Range, °F.: 650+
Yield, vol %: 50.8
Gravity, °API: 17.2
Total sulfur, wt %: 2.365
Rams. carbon, wt %: 7.90
Vis., SUS @ 122° F.: 1,146.9
V/Ni, ppm: 73/46

Hout, Divided Zone

Sea berth off Ras Al Khafji

Crude
Gravity, °API: 32.8
Sulfur, wt %: 1.91
Rvp, psi: 4.6
Pour pt, °F.: −13.0
Kin. vis., cSt @ 86° F.: 9.88
Con. carbon, wt %: 5.01
Asphaltenes, wt %: 1.65
Wax content, wt %: 3.2
Neut. no., mg KOH/g: 0.04
C_1-C_4, vol %: 1.8
V/Ni, ppm: 28/6

Light naphtha
Range (TBP), °F.: C_5-176
Yield, vol %: 6.3
Gravity, °API @ 60° F.: 83.7
Sulfur, wt %: 0.029
H_2S, ppm: 19
Rvp, psi: 10.3
RON, clear: 64.6
RON + 3.0 ml TEL/gal: 84.2
MON, clear: 61.0
Paraffins, vol %: 92.6
Naphthenes, vol %: 6.4
Aromatics, vol %: 1.0

Full range naphtha
Range (TBP), °F.: C_5-374
Yield, vol %: 24.5
Gravity, °API: 63.5
Sulfur, wt %: 0.035
H_2S, ppm: 26
Rvp, psi: 4.3
RON, clear: 44.0
MON, clear: 43.6
Aniline pt, °F.: 134
P/N/A, vol %: 70.8/15.6/13.6

Kerosine
Range, °F.: 374-482
Yield, vol %: 11.3
Gravity, API @ 60° F.: 445
Sulfur, wt %: 0.204
Pour pt, °F.: −49
Cloud pt, °F.: −49
Freeze pt, °F.: −42
Smoke pt, mm: 23.5
Aniline pt, °F.: 147
Saturates, vol %: 81.5
Aromatics, vol %: 18.0
Olefins, vol %: 0.5

Gas oil
Range, °F.: 482-644
Yield, vol %: 15.0
Gravity, °API @ 60° F.: 36.0
Sulfur, wt %: 1.07
Kin. vis. @ 100 °F.: 3.954
Pour pt, °F.: 14
Aniline pt, °F.: 163
Cetane index: 56.5

Residue
Range, °F.: 644+
Yield, vol %: 47.4
Gravity, °API @ 60° F.: 16.4
Sulfur, wt %: 3.39
Kin. vis., cSt @ 122° F.: 360.3
Pour pt, °F.: 68
Con. carbon, wt %: 10.3
V/Ni, ppm: 58/13

Residue
Range, °F.: 1,022+
Yield, vol %: 21.8
Gravity, °API @ 60° F.: 7.9
Sulfur, wt %: 4.39
Kin. vis., cSt @ 210° F.: 118.6
Pour pt, °F.: 91
Con. carbon, wt %: 20.7
Asphaltenes, wt %: 6.42
V/Ni,ppm: 110/31

Iranian Heavy, Iran

Kharg Island

Crude
Gravity, °API: 31.0
Total sulfur, wt %: 1.65
Vis., cSt @ 70° F.: 16.84
Vis., cSt @ 100° F.: 9.36
Pour pt, °F.: −5
C_1-C_4 yield, vol %: 2.38

Gasoline
Range (TBP), °C.: C_5-65
Yield, vol %: 3.49
Sp. gr. 60/60 °F.: 0.6468
RON, clear: 73.0
Paraffins, wt %: 93.5
Naphthenes, wt %: 5.7
Aromatics, wt %: 0.8

Light naphtha
Range, °C.: 65-149
Yield, vol %: 14.53
Sp. gr., 60/60 °F.: 0.7392
Total sulfur, wt %: 0.088
P/N/A, wt %: 53.4/33.1/13.5

Heavy naphtha
Range, °C.: 149-262
Yield, vol %: 18.26
Sp. gr., 60/60 °F.: 0.8041
Total sulfur: 0.289
Freezing pt, °C.: −50.0
Aromatics, vol %: 17.8
Aniline pt, °C.: 59.1
Smoke pt, mm: 23

Gas oil
Range, °C.: 262-352
Yield, vol %: 14.60
Total sulfur, wt %: 1.22
Cloud pt, °F.: 28
Pour pt, °F.: 24
Diesel index: 52

Residue
Range, °C.: 352+
Yield, vol %: 46.74
Total sulfur, wt %: 2.55
Vis., cSt @ 122° F.: 614
Vis, cSt @ 210° F.: 49.8
Con. carbon, wt %: 9.9
Asphaltenes, wt %: 3.8
V/Ni, ppm: 139/58

Assay sample taken at production rate of 1.84 million b/d with following field contributions in b/d:

Ahwaz—700,000
Gachsaran—628,000
Bibi Hakimeh—269,000
Kharg, Kupal, Monsuri and Rag E. Safid—251,000

Iranian Light, Iran

Kharg Island

Crude
Gravity, °API: 33.8
Pour pt, °F.: −20
Total sulfur, wt %: 1.35
Vis., cSt @ 70° F.: 10.58
@ 130° F.: 4.22

Gasoline
Range, °C.: C_5-65
Yield, vol %: 3.86
Sp. gr. 60/60° F.: 0.6465
RON, clear: 72.4
Paraffins, wt %: 94.4
Naphthenes, wt %: 4.8
Aromatics, wt %: 0.8

Light naphtha
Range, °C.: 65-149
Yield, vol %: 14.17
Sp. gr. 60/60° F.: 0.7387
Total sulfur, wt %: 0.040
P/N/A, wt %: 57.5/31.1/11.4

Heavy naphtha
Range, °C.: 149-262
Yield, vol %: 20.45
Sp. gr., 60/60° F.: 0.8028
Total sulfur, wt %: 0.198
Freezing pt, °C.: ——49
Aromatics, vol %: 18.0
Aniline pt, °C: 60.3
Smoke pt, mm: 24

Gas oil
Range, °C.: 262-352
Yield, vol %: 15.32
Sp. gr. 60/60° F.: 0.8599
Total sulfur, wt %: 1.05
Cloud pt, °F.: 28
Pour pt, °F.: 24
Diesel index: 53

Residue
Range, °C.: 352+
Yield, vol %: 43.3
Sp. gr. 60/60° F.: 0.9531
Total sulfur, wt %: 2.42
Vis., cSt @ 122° F.: 297.0
@ 210° F.: 29.8
Con. carbon, wt %: 9.0
Asphaltenes, wt %: 1.2
V/Ni, ppm: 70/32

Assay sample taken at production rate of 2.6 million b/d with following field contributions in b/d:

Agha Jari—870,000
Marun—1.03 million
Karanj—356,000
Paris—279,000
Pazanan—33,000

Khafji, Divided Zone

Sea berth off Ras Al Khafji

Crude
Gravity, °API: 28.5
Sulfur, wt %: 2.85

H_2S (dissolved), ppm: <1
Rvp, psi: 7.6
Pour pt, °F.: −31
Kin. vis., cSt @ 86° F.: 21.3
Con. carbon residue, wt %: 8.04
Asphaltenes, wt %: 4.32
Wax content, wt %: 2.7
Neut. no., mg KOH/g: 0.18
C_1-C_4, vol %: 3.41
V/Ni, ppm: 55/16

Light naphtha
Range (TBP), °F.: C_5-176
Yield, vol %: 5.5
Gravity, °API @ 60°F.: 85.2
Sulfur, wt %: 0.0028
Rvp, psi: 10.8
RON, clear: 66.2
RON + 1.0 ml TEL/gal: 78.5
MON, clear; 63.4
Paraffins, vol %: 93.9
Naphthenes, vol %: 5.4
Aromatics, vol %: 0.7

Full range naphtha
Range (TBP), °F.: C_5-374
Yield, vol %: 20.4
Gravity, °API @ 60° F.: 65.0
Sulfur, wt %: 0.0264
Rvp, psi: 4.3
RON, clear: 41.0
RON + 1 ml TEL/gal: 53.1
MON, clear: 41.2
Aniline pt, °F.: 139
P/N/A, vol %: 73.4/15.4/11.2

Kerosine
Range (TBP), °F. 374-482
Yield, vol %: 9.5
Gravity, °API @ 60° F.: 44.5
Sulfur, wt %: 0.324
Cloud pt, °F.: −45
Freeze pt, °F.: −45
Smoke pt, mm: 23.7
Aniline pt, °F.: 145
Saturates, vol %: 80.5
Aromatics, vol %: 19.0
Olefins, vol %: 0.5

Gas oil
Range (TBP). °F.: 482-644
Yield, vol %: 13.9
Sulfur, wt %: 1.42
Kin. vis. @ 100° F.: 3.9
Pour pt, °F.: 10
Cloud pt, °F.: 10
Aniline pt, °F.: 156
Cetane index: 54.2

Residue
Range (TBP), °F.: 644+
Yield, vol %: 52.8
Gravity, °API @ 60° F.: 12.1
Sulfur, wt %: 4.46
Kin. vis., cSt @ 122° F.: 1,795
Pour pt, °F.: 50
Con. carbon, wt %: 13.4
Asphaltenes, wt %: 7.84
V/Ni, ppm: 95/28

Residue
Range (TBP), °F.: 991+
Yield, vol %: 27.8
Gravity, °API @ 60°F.: 4.5
Sulfur, wt %: 5.65
Kin. vis., cSt @ 210° F.: 6,043
Pour pt, °F.: 145
Con. carbon, wt %: 24.4
Asphaltenes, wt %: 15.4
V/Ni, ppm: 170/49

Kirkuk Blend, Iraq

Mina-al-Bakr sea terminal in Persian Gulf also Ceyhan (Dortyol), Turkey

Crude
Gravity, °API: 35.1
Sulfur, wt %: 1.97
Pour pt, °C.: −22
Kin. vis., cSt @ 10° C.: 12.8
C_4 & lighter, wt %: 1.8

Light SR naphtha
Range, °C.: C_5-65
Yield, wt %: 4.1
Density @ 15° C., g/cu m: 0.644
RON + 0.4 g Pb/l: 81

Heavy SR naphtha
Range, °C.: 65-175
Yield, wt %: 18.1
Density @ 15° C., g/cu m: 0.740
RON + 0.4 g Pb/l: 58.5
Aromatics, vol %: 10.5
Naphthenes, vol %: 22

Kerosine
Range, °C.: 175-225
Yield, wt %: 8.7
Density @ 15° C., g/cu m: 0.794
Sulfur, wt %: 0.19

Gas oil
Range, °C.: 225-360
Yield, wt %: 24.0
Density @ 15° C., g/cu m: 0.843
Sulfur, wt %: 1.18
Pour pt, °C.: −12
Cold filter pour pt, °C.: −9
Kin. vis., cSt @ 100° C.: 1.34

Heavy gas oil
Range, °C.: 360-525
Yield, wt %: 22.9
Density @ 15° C., g/cu m: 0.917
Sulfur, wt %: 2.35
Kin. vis., cSt @ 100° C.: 7.98

Long residuum
Range, °C.: 360+
Yield, wt %: 43.3
Density @ 15° C., g/cu m: 0.968
Sulfur, wt %: 3.76
Kin. vis., cSt @ 100° C.: 42.9

Short residuum
Range, °C.: 525+
Yield, wt %: 20.4
Density @ 15° C., g/cu m: 1.003
Sulfur, wt %: 5.30
Kin. vis., cSt @ 100° C.: 1,550
Con. carbon, wt %: 21.0
V/Ni, ppm: 142/54

Kuwait Export, Kuwait

Mina al Ahmadi

Crude
Gravity, °API: 31.4
Vis., SUV, sec @ 100° F.: 58.1
Pour pt, °F.: +5
Sulfur, wt %: 2.52
Ni/V (calc.), ppm: 8/30
Rvp, psi: 6.7
H_2S, wt %: <0.001
C_1-C_4 (GC analysis), vol %: 3.03

Naphtha
Range, °F.: Over point — 140
Yield, vol %: 3.80
Gravity, °API: 89.7
Sulfur, wt %: 0.04
RON (micro), clear: 71.8
RON + 3 ml TEL: 89.3

Naphtha
Range, °F.: 140-170
Yield, vol %: 2.26
Gravity, °API: 78.6
Sulfur, wt %: 0.02
Aniline pt, °F.: 147.7
RON, clear/+ 3 ml TEL: 58.2/80.40
Paraffins, vol %: 88.5
Monocycloparaffins, vol %: 9.9
Aromatics, total, vol %: 1.6

Heavy naphtha
Range, °F.: 170-310
Yield, vol %: 11.91
Gravity, °API: 62.1
Sulfur, wt %: 0.03
Aniline pt, °F.: 136.2
Paraffins, vol %: 70.1
Monocycloparaffins, vol %: 20.4
Dicycloparaffins, vol %: 0.4
Aromatics, total, vol %: 9.1

Kerosine
Range, °F.: 310-520
Yield, vol %: 18.43
Gravity, °API: 45.9
Pour pt, °F.: −45
Sulfur, wt %: 0.39
Aniline pt, °F.: 142.9
Cetane index: 53.8
Smoke pt, mm: 26

Heating oil
Range, °F.: 520-680
Yield, vol %: 14.89
Gravity, °API: 32.9
Vis., SUV, sec. @ 100° F.: 43.3
Pour pt, °F.: +20
Total N, ppm: 100
Sulfur, wt %: 1.98
Aniline pt, °F.: 160.2
Cetane index: 54.3

Gas oil
Range, °F.: 680-1,000
Yield, vol %: 24.09
Gravity, °API: 21.4
Pour pt, °F.: +100
Sulfur, wt %: 3.12
Total N, ppm: 900
Ni/V, ppm: <0.1/<0.1
Vis., SUV, sec @ 130° F.: 175.2
Rams. carbon residue, wt %: 0.47

Residuum
Range (VEFV), °F.: 1,000+
Yield, vol %: 21.78
Gravity, °API: 5.8
Sulfur, wt %: 5.11
V/Ni, ppm: 116/34
Vis., SUV, sec @ 250° F.: 3,394
Rams. carbon residue, wt %: 21.9

Mubarek, Sharjah, U.A.E.

Floating storage and loading facility in offshore producing area

Crude
Gravity, °API: 37
Sulfur, wt %: 0.62
Rvp, psi: 4.8
Pour pt, °F.: 10
Salt, lb/1,000 bbl: 23
Vis., cSt @ 100° F.: 3.20
@ 122° F.: 2.80
Gas, vol % of crude: 0.7

Light straight run
Range, °F.: ibp-220
Yield, vol %: 12.7
Octane, F-1 clear: 68.2
Gravity, °API: 72.2
Rvp, psi: 11.8
Sulfur, wt %: 0.01

Light naphtha
Range, °F.: 220-300
Yield, vol %: 9.1
Paraffins, vol %: 51.6
Naphthenes, vol %: 30.4
Aromatics, vol %: 18.0
Octane, F-1 clear: 50.5
Gravity, °API: 55.2
Sulfur, wt %: 0.01

Heavy naphtha
Range, °F.: 300-360
Yield, vol %: 7.2
P/N/A, vol %: 48.5/28.8/22.7
Gravity, °API: 49.9
Sulfur, wt %: 0.01

Kerosine
Range, °F.: 360-500
Yield, vol %: 17.6
Gravity, °API: 42.7
Smoke pt, mm: 25
Aniline pt, °F.: 134
Diesel index: 57.2
Pour pt, °F.: −55
Sulfur, wt %: 0.04
Vis., cSt @ 100° F.: 1.40

Light gas oil
Range, °F.: 500-700
Yield, vol %: 21.4
Gravity, °API: 32.6
Aniline pt, °F.: 156
Diesel index: 50.9
Pour pt, °F.: 20
Rams. carbon residue, wt %: 0.66
Sulfur, wt %: 0.66
Vis., cSt @ 100° F.: 4.55
  @ 210° F.: 1.54
Bromine no.: 0.6

Residuum
Range, °F.: 700+
Yield, vol %: 30.8
Gravity, °API: 19.6
Rams. carbon residue, wt %: 4.74
Sulfur, wt %: 1.18

Residuum
Range, °F.: 1,000+
Yield, vol %: 9.2
Gravity, °API: 12.2
Rams. carbon residue, wt %: 15.09
Sulfur, wt %: 1.43
V/Ni, ppm: 11.40/6.0

Murban, Abu Dhabi

Port of Jebel Dhanna/4 CBM berths

Crude
Gravity, °API: 40.45
Rvp @ 37.8° C., psia: 3.46
Pour pt, °C.: −24
Kin. vis., cSt @ 40° C.: 2.70
Sulfur, wt %: 0.78
V/Ni, ppm: <0.1/0.7
Con. carbon, wt %: 1.35
Charac. factor, K_{UOP}: 12.1

Naphtha
Range (TBP), °C.: 20-165
Yield, vol %: 27.4
Position on crude, vol %: 1.9-29.3
Gravity, °API: 63.47
Sulfur, ppm: 43
RON, clear: 50

Naphtha
Range (TBP), °C.: 20-180
Yield, vol %: 31.2
Position on crude, vol %: 1.9-33.1
Gravity, °API: 61.48
Sulfur, ppm: 64
RON, clear: 47

Kerosine
Range (TBP), °C.: 150-220
Yield, vol %: 16.6
Position on crude, vol %: 25.3-41.9
Gravity, °API: 18.22
Smoke pt, mm: 24
Freeze pt, °C.: −46
Aromatics, vol %: 21
Aniline pt, °C.: 55.2
Sulfur, wt %: 0.022

Diesel
Range (TBP), °C.: 220-350
Yield, vol %: 26.0
Gravity, °API: 37.37
Sulfur, wt %: 0.62
Cloud pt, °C.: −12
Pour pt, °C.: −12
Vis., cSt @ 100° C.: 1.25
Aniline pt, °C.: 72.3
Diesel index: 60.6
Cetane index: 60
Con. carbon on 10% residue, wt %: <0.01

Residuum
Range (TBP), °C.: 350+
Yield, vol %: 32.1
Gravity, °API: 22.72
Sulfur, wt %: 1.73
Vis., cSt @ 100° C.: 10.85
Con. carbon, wt %: 4.3
Asphaltenes, wt %: 0.15
Pour pt, °C.: +33
V/Ni, ppm: 0.4/2.0
Flash pt, °C.: 214
Nitrogen, wt %: 0.125

Residuum
Range (TBP), °C.: 540+
Yield, vol %: 9.3
Gravity, °API: 13.99
Sulfur, wt %: 2.20
Vis., cSt @ 50° C.: 3,340.
Con. carbon, wt %: 11.5
Asphaltenes, wt %: 0.74

Oman Export, Oman

Mina al Fahal

Crude
Gravity, °API: 36.3
Sulfur, wt %: 0.79
Pour pt, °F.: −15
Rvp, psi: 4.2
Vis., SUS @ 60° F.: 64.8
Yield, ibp to 113 °F., vol %: 3.63

Fraction yields (partial)
Range/vol %:
  390-450/6.73
  450-500/5.74
  500-550/5.64
  550-650/10.76

Straight run
Range, °F.: 113-220
Yield, vol %: 7.54
Gravity, °API: 70.4
RON + 3 cc Pb: 74.2
Sulfur, wt %: 0.0
Paraffins, vol %: 77.0
Naphthenes, vol %: 18.24
Aromatics, vol %: 4.8

Naphtha
Range, °F.: 220-390
Yield, vol %: 17.77
Gravity, °API: 55.3
Sulfur, wt %: 0.03
P/N/A, vol %: 67.6/21.3/10.1
Dinaphthenes, vol %: 1.0

Kerosine
Range, ° F.: 315-500
Yield, vol %: 20.56
Gravity, °API: 46.5
Sulfur wt %: 0.12
Aromatics, vol %: 12.9
Smoke pt, mm: 26
Freeze pt, °F.: −56
Pour pt, °F.: −70

Light gas oil
Range, °F.: 450-650
Yield, vol %: 22.14
Gravity, °API: 37.5
Cetane index: 57.0
Sulfur, wt %: 0.42
Total N, ppm: 31
Aniline pt, °F.: 168.3
Pour pt, °F.: −15

Heavy gas oil
Range, °F.: 650-1,000
Yield, vol %: 26.15
Gravity, °API: 26.8
Sulfur, wt %: 0.98
Total N, ppm: 516
Pour pt, °F.: 70
Carbon residue, wt %: 0.14

Flashed residue
Range, °F.: 1,000+
Yield, vol %: 16.03
Gravity, °API: 14.2
Sulfur, wt %: 1.96
Vis., SSF @ 210 °F.: 196.0

Qatar Marine, Qatar

Halul Island

Crude
Gravity, °API: 35.3
Sulfur, wt %: 1.57
Pour pt, °F.: 10
H_2S g/100 cc: 0.0315
Vis., SSU @ 60° F.: 53.4

Light straight run
Range, °F.: 40-155
Yield, vol %: 6.45
Gravity, °API: 82.5
Sulfur, wt %: 0.05
P/N/A, vol %: 88.7/9.5/1.7

Light naphtha
Range, °F.: 155-265
Yield, vol %: 9.45
Sulfur, wt %: 0.03
Paraffins, vol %: 60.6
Naphthenes, vol %: 23.3
Aromatics, vol %: 16.1

Heavy naphtha
Range, °F.: 265-350
Yield, vol %: 10.07
Gravity, °API: 51.8
Sulfur, wt %: 0.04
P/N/A: 56.7/18.5/22.9
Dinaphthenes, vol %: 1.9

Kerosine
Range, °F.: 350-500
Yield, vol %: 16.28
Gravity, °API: 43.1
Cetane index (calculated): 47.5
Sulfur, wt%: 0.18
Aromatics, vol %: 24.0
Smoke pt, mm: 19.0
Freeze pt, °F.: −44
Pour pt, °F.: −50

Heavy gas oil
Range, °F.: 500-650
Yield, vol %: 15.50
Cetane index (calculated): 51.6
Sulfur, wt %: 1.24
Total N, ppm: 72
Pour pt, °F.: 25

Residue
Range, °F.: 650+
Yield, vol %: 39.53
Gravity, °API: 16.5
Sulfur, wt %: 2.73
Vis., SUS @ 210° F.: 121.5

Residue
Range, °F.: 1,000+
Yield, vol %: 19.33
Gravity, °API: 10.3
Sulfur, wt %: 3.4
Con. carbon, wt %: 12.5
V/Ni, ppm: 31/7

Rostam, Iran

Lavan Island terminal

Crude
Gravity, °API: 35.9
Vis., cSt @ 50° C.: 3.08
Pour pt, °C.: −22.5
Sulfur, wt %: 1.55
NaCl, wt%: 0.036

Gasoline
Range, °F.: Ibp-165
Yield, vol %: 24.2
RON, clear: 61.4

Kerosine
Range, °C.: 165-220
Yield, vol %: 11.2

Gas oil
Range, °C.: 220-310
Yield, vol %: 17.3

Residuum
Yield, vol %: 45.8
Pour pt, °C.: +12.5
Sulfur, wt %: 2.82
Carbon, wt %: 6.25

Note: Same assay first published in 1976.

Salmon (Sassan), Iran*

Levan Island

Crude
Gravity, °F.: 33.9
Paraffin, wt%: 1.9
Sulfur, wt %: 1.91
Pour pt, °F.: −5
Vis., SUS @ 77° F.: 52.1
@ 100° F.: 44.2
Bs&w: 17,550

Straight-run gasoline
Range, vapor-cut points, °F.: 50-200
Yield, vol %: 10.5
Gravity, °API: 77.6
Sulfur, wt %: 0.081
Mercaptan sulfur: 0.067
Octane no., F-1 clear: 61.0

Naphtha
Range, VCP, °F.: 200-375
Yield, vol %: 16.4
Gravity, °API: 53.3
Sulfur, wt %: 0.0820
Mercaptan S, wt %: 0.002
Aniline pt, °F.: 121.5
Octane no., F-1 clear: 35.4
Arom. + naphthenes, vol %: 41

Kerosine
Range VCP, °F.: 375-450
Yield, vol %: 7.5
Gravity, °API: 45.1
Sulfur, wt %: 0.19
Freezing pt, °F.: −50
Aniline pt, °F.: 137.9
Smoke pt, mm: 20
Kin. vis., cSt @ 60° F.: 2.05
@ 100° F.: 30

Gas oil
Range VCP, °F.: 450-700
Yield, vol %: 23.8
Gravity, °API: 34.1
Sulfur, wt %: 1.2
Pour pt, °F.: +15
Aniline pt, °F.: 153.3
Kin. vis., cSt @ 60° F.: 7.52
@ 100° F.: 4.03
Cetane no.: 56.3

Residual oil
Range VCP, °F.: 700+
Yield, vol %: 39.7
Gravity, °API: 15.3
Sulfur, wt %: 3.5
Pour pt, °F.: +75
Vis., SUS @ 210° F.: 154
@ 275° F.: 67.8
V + Ni, ppm: 44

Residual oil
Range, VCP, °F.: 1,070+
Yield, vol %: 12.0
Gravity, °API: 1.3
Sulfur, wt %: 5.0
Vis., SUS @ 210° F.: 8,000
@ 275° F.: 1,000
V + Ni, ppm: 127

* New assay not available. This one first published in OGJ in 1976. Sassan is produced from same reservoir as Abu Al Bu Khoosh.

Sirri, Iran

Offshore terminal in Persian Gulf producing area

Crude
Gravity, °API: 30.9
Kin. vis., cSt @ 10° C.: 20.3
@ 37.8° C.: 7.36
Pour pt, °C.: −9
Total sulfur, wt %: 2.3
Rvp, bars: 0.650
Paraffins, wt %: 3.43
Asphaltenes, wt %: 1.48
V/Ni/Fe, ppm: 41/12/3
Yield C_1—C_5, vol %: 7.14

Light gasoline
Range, °C.: C_5-80
Yield, vol %: 5.19
RON, clear: 64.1
Total sulfur, wt %: 0.0080

Heavy gasoline
Range, °C.: 80-180
Yield, vol %: 15.28
Paraffins, vol %: 59.0
Naphthenes, vol %: 30.0
Aromatics, vol %: 11.0
Sulfur, wt %: 0.078

Kerosine
Range, °C.: 180-225
Yield, vol %: 7.54
Smoke pt, mm (150°-225° C.): 18.50
Sulfur, wt %: 0.436

Gas oil
Range, °C.: 180-350
Yield, vol %: 29.61
Pour pt, °C.: −21
Total sulfur, wt %: 1.42
Aniline pt, °C.: 62.2
Diesel index (calculated): 51.9

Residue
Range, °C.: 350+
Yield, vol %: 46.33
Pour pt, °C.: +21
Kin. vis., cSt @ 50° C.: 375
@ 70° C.: 120
Total sulfur, wt %: 3.65
Asphaltenes, wt %: 3.01
Con. carbon, wt %: 9.53
V/Ni/Fe, ppm: 70/20/4

Soroosh (Cyrus), Iran

Offshore terminal with SBM in production area

Crude
Gravity, °API: 18.1
Sulfur, wt %: 3.3
Rvp, psi: 0.3
H_2S (evolved), wt %: 0.007
Pour pt, °F.: 10
Neut. no., mg KOH/g: 0.50
Rams. carbon, wt %: 12.2
Kin. vis., cSt @ 68° F.: 1,381.4
V/Ni, ppm: 101/35
C_1-C_5, vol %: 1.32

Naphtha
Range, °F.: C_5-200
Yield, vol %: 3.3
Gravity, °API: 77.3
Sulfur, wt %: 0.008
Charac. factor: 12.49
Paraffins, vol %: 69.1
Naphthenes, vol %: 29.7
Aromatics, vol %: 1.1
RON/MON, clear: 73.5/70.6

Naphtha
Range, °F.: 200-320
Yield, vol %: 5.1
Gravity, °API: 57.8
Sulfur, wt %: 0.021
Charac. factor: 12.00
P/N/A, vol %: 49.0/42.2/8.8
RON/MON, clear: 49.9/50.5

Kerosine
Range, °F.: 320-520
Yield, vol %: 11.6
Gravity, °API: 42.5
Sulfur, wt %: 0.37
Charac. factor: 11.76
Aromatics, vol %: 15.7
Aniline pt, °F.: 140.8
Diesel index: 59.8
Cetane index: 44.6
Freeze pt, °F.: −46
Cloud pt, °F.: −41
Pour pt, °F.: −55
Smoke pt, mm: 25
Neut no., mg KOH/g: 0.10
Vis., SUS @ 68° F.: 32.6

Gas oil
Range, °F.: 520-650
Yield, vol %: 9.6
Gravity, °API: 33.0
Sulfur, wt %: 1.19
Charac. factor: 11.72
Aniline pt, °F.: 152.9
Diesel index: 50.5

Cetane index: 49.0
Cloud pt, °F.: 11
Pour pt, °F.: 6
Naphthalenes, vol %: 13.68
Vis., SUS @ 68 °F.: 47.9

Residuum
Range, °F.: 650°
Yield, vol %: 70.1
Gravity, °API: 9.2
Sulfur, wt %: 4.3
Pour pt, °F.: 99
Rams. carbon, wt %: 16.31
Vis., SUS @ 210° F.: 1,439.8
V/Ni, ppm: 135/47

Residuum
Range, °F.: 1,050+
Yield, vol %: 36.5
Gravity, °API: −0.2
Sulfur, wt %: 5.6
Pour pt, °F.: 213
V/Ni, ppm: 237/82

Souedie, Syria

Tartus/CBMs

Crude
Gravity, °API: 24.9
Sulfur, wt %: 3.82
Pour pt, °C.: −30
Kin. vis. @ 10° C.: 88.3
C_4 & lighter: 0.8

Light SR naphtha
Range, °C.: C_5-65
Yield, wt %: 3.2
Density @ 15° C., g/cu cm: 0.647
RON + 0.4 g Pb/l: 79.5

Heavy SR naphtha
Range, °C.: 65-175
Yield, wt %: 13.1
Density @ 15° C., g/cu m: 0.734
RON + 0.4 g Pb/l: 58
Naphthenes, vol %: 18
Aromatics, vol %: 10.5

Kerosine
Range, °C.: 175-225
Yield, wt %: 6.0
Density @ 15° C., g/cu m: 0.798
Sulfur, wt %: 0.38

Gas oil
Range, °C.: 225-360
Yield, wt %: 19.7
Density @ 15° C., g/cu m: 0.865
Sulfur, wt %: 2.50
Pour pt, °C.: −14
CFPP, °C.: −11
Kin. vis., cSt @ 100° C.: 1.40

Heavy gas oil
Range, °C.: 360-425
Yield, wt %: 9.8
Density @ 15° C., g/cu m: 0.925
Sulfur, wt %: 3.90
Kin. vis., cSt @ 100° C.: 4.3

Long residuum
Range, °C.: 360+
Yield, wt %: 57.2
Density @ 15° C., g/cu m: 1.015
Sulfur, wt %: 5.90
Kin. vis., cSt @ 100° C.: 330.0

Short residuum
Range, °C.: 425+
Yield, wt %: 47.4
Density @ 15° C., g/cu m: 1.040
Sulfur, wt %: 6.0
Kin. vis., cSt @ 100° C.: 1,800
Con. carbon residue, wt %: 21.5
V/Ni, ppm: 185/60

Umm Shaif (Abu Dhabi Marine), Abu Dhabi

Das Island

Crude
Gravity, °API: 37.4
Sulfur, wt %: 1.51
Pour pt, °C.: −30
Rvp @ 37.8° C., psia: 7.05
H_2S, ppm: <2
Asphalt, wt %: 0.13

Light naphtha
Range (TBP), °C.: C_5-80
Yield, vol %: 8.2
Gravity, °API: 83.1
Charac. factor K: 12.73
Sulfur, ppm : 1,030
RON, clear: 65
RON + 1.5 ml/v.s. gal TEL: 74.5
MON, clear: 61

Heavy naphtha
Range (TBP), °C.: 80-150
Yield, vol %: 13.7
Gravity, °API: 59.26
Sulfur, wt %: 0.052

Kerosine
Range (TBP), °C.: 150-230
Yield, vol %: 15.8
Gravity, °API: 47.53
Freeze pt, °C.: −53.0
Aniline pt, °C.: 54.6
Aromatics, vol %: 21.0
Smoke pt, mm: 23.0
Sulfur, wt %: 0.095

Diesel
Range (TBP), °C.: 230-375
Yield, vol %: 25.8
Gravity, °API: 34.49
Sulfur, wt %: 1.18
Pour pt, °C.: −12
Aniline pt, °C.: 69.6
Diesel index: 54.8
Cetane index: 51.2

Residue
Range (TBP), °C.: 350+
Yield, vol %: 37.4
Gravity, °API: 19.1
Kin. vis., cSt @ 50° C.: 104.7
Pour pt, °C.: +27
Sulfur, wt %: 2.78
Asphaltenes, wt %: 0.1
Con. carbon, wt %: 5.3
V/Ni, ppm: 7.1/1.9

Residue
Range (TBP), °C.: 550+
Yield, vol %: 12.3
Gravity, °API: 10.15
Kin. vis., cSt @ 100° C.: 315
Pour pt, °C.: +21
Sulfur, wt %: 3.73
Asphaltenes, wt %: 0.24
Con. carbon, wt %: 14.4
V/Ni, ppm: 19.0/5.0

Zakum (Lower Zakum/ Abu Dhabi Marine), Abu Dhabi

Das Island

Crude
Gravity, °API: 40.6
Rvp @ 37.8 °C., psia: 8.37
Pour pt, °C.: −21
Kin. vis., cSt @ 20° C.: 4.28
Sulfur, wt %: 1.05
Charac. factor, K_{UOP}: 12.28
Asphaltene content, wt %: 0.05

Light straight run
Range (TBP), °C.: C_5-80
Yield, vol %: 8.6
Gravity, API: 82.7
Rvp @ 100 °F., psia: 11.6
Sulfur, ppm: 1.5
RON, clear: 66
MON, clear: 64

Naphtha
Range (TBP), °C.: C_5-160
Yield, vol %: 25.60
Gravity, °API: 66.5
Sulfur, ppm: 16.0

Kerosine
Range (TBP), °C.: 160-250
Yield, vol %: 18.8
Gravity, °API: 46.15
Kin. vis., cSt @ −20° C.: 4.10
Freeze pt, °C.: −48
Aniline pt, °C.: 58
Aromatics, vol %: 21.7
Smoke pt, mm: 23.5
Sulfur wt %: 0.063

Diesel
Range (TBP), °C.: 190-343
Yield, vol %: 29.30
Gravity, °API: 39.52
Sulfur, wt %: 0.52
Cloud pt, °C.: −18
Pour pt, °C.: −21
Vis., cSt @ 40° C.: 2.20
Aniline pt, °C.: 66.8
Diesel index: 60.2
Cetane index: 56.5

Residue
Range, °C.: 350+
Yield, vol %: 33.7
Gravity, °API: 21.8
Kin. vis., cSt @ 50° C.: 69.1
Pour pt, °C.: +33
Sulfur, wt %: 2.2
Asphaltenes, wt %: 0.2
Con. carbon, wt %: 4.0
V/Ni, mg/kg: 1.0/0.9

Residue
Range, °C.: 550+
Yield, vol %: 10.10
Gravity, °API: 13.2
Kin. vis., cSt @ 100° C.: 147.6
Pour pt, °C.: +18
Sulfur, wt %: 2.96
Asphaltenes, wt %: 1.0
Con. carbon, wt %: 13.6
V/Ni, mg/kg: 3.0/2.5

North Sea

Argyll, U.K. North Sea

SBM in producing area

Crude
Density @ 15° C.: 0.8349
Sulfur, wt %: 0.18
Pour pt, °C.: +6
Vis., cSt @ 40° C.: 4.79

Naphtha
Range, °C.: Ibp—175
Yield, vol %: 25.2
Density @ 15° C.: 0.728
Sulfur, wt %: <0.001

Kerosine
Range, °C.: 175-260
Yield, vol %: 14.9

Density @ 15° C.: 0.804
Sulfur, wt %: 0.03
Copper strip test: 1.A
Smoke pt, mm: 22
Freeze pt, °C.: —37

Gas oil
Range, °C.: 260-360
Yield, vol %: 18.9
Density @ 15° C.: 0.839
Sulfur, wt %: 0.11
Cetane index: 64.5
Cloud pt, °C.: 0
Pour pt, °C: —3
Cold filter pt, °C.: —2
Vis., cSt @ 40° C.: 4.45

Residue
Range, °C.: 360+
Yield, vol %: 40.6
Density @ 15° C.: 0.9136
Sulfur, wt %: 0.34
V/Ni/Fe, ppm: 3.9/2.1/2.7
Pour pt, °C: +30
Vis., cSt @ 100° C.: 17.19

Auk, U.K. North Sea

SBM in producing area

Crude
Gravity, °API @ 60° F.: 37.15
Sulfur, wt %: 0.45
Wax, wt %: 6.5
Pour pt (ASTM max.), °C./°F.: +9/+50
Kin. vis., cSt @ 40° C.: 4.38
H_2S existent/potential ppm: <1/<1
Acid value, mg KOH/g (TAN): 0.13
Rvp, lb: 6
C_4—, vol %/wt %: 2.2/1.5

Gasoline
Range, °C.: C_5—85
Yield, vol %/wt %: 8.0/6.5
Sp gr @ 15° C.: 0.685
RON, clear: 66
RON + 0.5 g Pb/l Pb: 82

Naphtha
Range, °C.: 85-165
Yield, vol %/wt %: 15.5/14.0
Sp gr @ 15° C.: 0.755
Sulfur, wt %: 0.002
P/N/A, wt %: 51/34/15

Kerosine
Range, °C.: 165-235
Yield, vol %/wt %: 13.0/12.5
Sp gr @ 15° C.: 0.802
Sulfur, wt %: 0.01
Smoke pt, mm: 25
Aromatics, vol %: 19

Gas oil
Range, °C.: 235-300
Yield, vol %/wt %: 12.5/12.4
Sp gr @ 15° C.: 0.828
Sulfur, wt %: 0.09
Cetane no.: 60
Cloud pt, °C: —19

Gas oil
Range, °C.: 300-350
Yield, vol %/wt %: 9.4/9.6
Sp gr @ 15° C.: 0.847
Sulfur, wt %: 0.35
Cetane no.: 63
Cloud pt, °C.: +9
Kin. vis., cSt @ 40° C.: 5.53

Residue
Range, °C.: 350+
Yield, vol %/wt %: 39.2/43.5
Sp gr @ 15° C.: 0.932
Sulfur, wt %: 0.93
Wax, wt %: 13
Pour pt, °C.: +45
Kin vis., cSt @ 60° C.:96.7

@ 100° C.: 20.7
Acid value. 0.15
Asphaltenes, wt %: 4.0
Con. car. residue: 7%
V/Ni, ppm: 14/3

Beatrice, U.K. North Sea

Nigg Bay terminal

Crude
Gravity, °API: 38.7
Sulfur, wt %: 0.05
Pour pt, °F.: 55
Rvp, psi.: 5.60
Vis., cSt @ 104° F.: 6.85
@ 122° F.: 5.15
C_1—C_5, yield, vol %: 3.77

Light naphtha
Range, VT °F.: 68-158
Yield, vol %: 3.6
Gravity, °API: 86.5
Rvp, psi: 7.9
RON, clear: 64.6
MON, clear: 63.2
Paraffins, vol %: 93.1
Naphthenes, vol %: 6.2
Aromatics, vol %: 0.7

Naphtha
Range, °F.: 158-212
Yield, vol %: 3.5
Gravity, °API: 67.0
Total sulfur, wt %: 0.0002
P/N/A, vol %: 63.7/32.0/4.3

Heavy naphtha
Range, °F.: 212-302
Yield, vol %: 7.3
Gravity, °API: 59.4
Total sulfur, wt %: 0.0004
P/N/A vol %: 69.2/18.6/12.2

Kerosine
Range, °F.: 302-401
Yield, vol %: 8.8
Gravity, °API: 52.4
Total sulfur, wt %: 0.0024
Smoke point, mm: 37
Freeze pt, °F.: —67
Cloud pt, °F.: —70
Pour pt, °F.: —75
Aniline pt, °F.: 148.4
Diesel index: 78
Aromatics, vol %: 8.5
Vis., cSt @ 100° F.: 1.08
@ 210° F.: 0.59

Middle distillate
Range, °F.: 401-509
Yield, vol %: 10.8
Gravity °API: 44.6
Total sulfur, wt %: 0.0081
Aniline pt, °F.: 163.9
Diesel index: 73
Cetane index: 59
Cloud pt, °F.: —4
Pour pt, °F.: —10
Vis., cSt @ 100° F.: 1.89
@ 212° F.: 0.88

Middle distillate
Range, °F.: 401-650
Yield, vol %: 25.8
Gravity, °API: 41.7
Total sulfur, wt %: 0.0191
Aniline pt, °F.: 176.8
Diesel index: 74
Cetane index: 65
Cloud pt, °F.: 38
Pour pt, °F.: 35
Vis., cSt @ 212° F.: 1.21

Gas oil
Range, °F.: 650-1,049
Yield, vol %: 34.7
Gravity, °API: 31.5
Total sulfur, wt %: 0.061
Aniline pt, °F.: 221.3
Con. carbon, wt %: 0.14
Pour pt, °F.: 105
Vis., cSt @ 212° F.: 5.03
V/Ni/Fe, wt ppm: 0.13/0.03/0.18

Residue
Range, °F.: 1,049+
Yield, vol %: 14.4
Gravity °API: 18.7
Total sulfur, wt %: 0.15
Con. carbon, wt %: 9.3
Vis., cSt @ 212° F.: 150
V/Ni/Fe, wt ppm: 0.95/4.20/16.50

Beryl, U.K. North Sea

SBM in producing area

Crude
Gravity, °API: 36.5
Kin. vis., cSt @ 59° F.: 9.47
Con. carbon residue, wt %: 1.3
Sulfur, wt %: 0.42
Rvp, psi: 5.2
V/Ni, ppm: 3.7/0.8
C_5 & lighter, vol %: 4.27

Naphtha
Range (TBP), °F.: 60-120
Yield, vol %: 2.29
Rvp, psi: 17.5
Paraffins, vol %: 97.5
Naphthenes, vol %: 2.5
Aromatics, vol %: 0.0
RON, clear: 80.5

Naphtha
Range, °F.: 120-330
Yield, vol %: 21.89
Sp gr, 60°/60° F.: 0.7519
Rvp, psi: 2.5
P/N/A, vol %: 48.7/33.8/17.6
RON, clear: 61.4
RON + 3 ml TEL: 81.6
Sulfur, wt %: 0.0014
Nitrogen, ppm: 2.2

Kerosine
Range, °F.: 330-425
Yield, vol %: 10.70
Sp gr: 0.7976
P/N/A, vol %: 42.5/36.4/21.1
Sulfur, wt %: 0.0168

Light gas oil
Range, °F.: 425-650
Yield, vol %: 24.75
Sp gr: 0.8441
Gravity, °API: 36.1
Pour pt, °F.: 5
Aniline pt, °F.: 155.5
Diesel index: 56
Cetane index: 51
Sulfur, wt %: 0.21

Heavy gas oil
Range, °F.: 650-995
Yield, vol %: 25.89
Gravity, °API: 26.1
Sp gr: 0.8981
Pour pt, °F.: 95
Kin. vis., cSt @ 100° F.: 38.30
Aniline pt, °F.: 190.8
Total nitrogen, ppm: 1,317

Residue
Range, °F.: 995+
Yield, vol %: 12.95
Gravity, °API: 14.4
Sp gr, 60/60° F.: 0.9698
Pour pt, °F.: 120
Kin. vis., cSt @ 100° F.: 14,827.95
Sulfur, wt %: 1.04
Con. carbon, wt %: 8.80
V/Ni, ppm: 24.0/5.7

Residue
Range, °F.: 650+
Yield, vol %: 38.85
Gravity, °API: 22.0
Sp gr: 0.9220
Pour pt, °F.: 100
Kin. vis., cSt @ 100° F.: 190.47
Sulfur, wt %: 0.78
Total nitrogen, ppm: 2,258
Con. carbon, wt %: 3.14
V/Ni, ppm: 8.4/2.0

Brae, U.K. North Sea

Scheduled to join Forties system in mid 1983

Crude
Gravity, °API: 33.6
Sulfur, wt %: 0.73
Vis., cSt @ 10° C.: 13.6
Pour pt., °C.: —6
Carbon residue, wt %: 2.3
Asphaltenes, wt %: 0.35
V/Ni, ppm wt: 2.5/0.4
C_1—C_4, wt %: 2.15

Gasoline
Range (TBP), °C.: C_5—95
Yield, vol %: 9.25
Density @ 15° C., kg/l: 0.6985

Naphtha
Range, °C.: C_5—149
Yield, vol %: 21.45
Density @ 15° C., kg/l: 0.7405
Sulfur, wt %: 0.0005
P/N/A, wt %: 51.4/30.9/25.6

Kerosine
Range, °C.: 149-232
Yield, vol %: 15.2
Density @ 15° C., kg/l: 0.8125
Sulfur, wt %: 0.034
Aromatics, vol %: 25.7
Smoke pt, mm: 21
Cold test, °C.: —62
Aniline pt, °C.: 45.5
Diesel index: 49
Cetane index: 40

Gas oil
Range, °C.: 232-342
Yield, vol %: 21.3
Density @ 15° C., kg/l: 0.864
Sulfur, wt %: 0.55
Cloud pt, °C.: —15
Pour pt, °C.: —18
Acidity, mg KOH/g: 0.02
Aniline pt, °C.: 60.6
Diesel index: 45
Cetane index: 47

Residue
Range, °C.: 342+
Yield, vol %: 39.3
Density @ 15° C., kg/l: 0.9435
Sulfur, wt %: 1.41
Vis., cSt @ 50° C.: 128
Pour pt, °C.: 36
Carbon residue, wt %: 5.5
Asphaltenes, wt %: 0.75
V/Ni, ppm wt: 6.5/0.9

F.C.C. feed
Range, °C.: 369-509
Yield, vol %: 20.55
Density @ 15° C., kg/l: 0.921
Vis., cSt @ 100° C.: 7.22
Wax, wt %: 14
Aniline pt, °C.: 79.2

Note: Assay run on preproduction crude sample

Brent, U.K. North Sea

Brent system to Sullom Voe and SPAR in producing area

Crude
Gravity, °API @ 60° F.: 38.16
Sulfur, wt %: 0.26
Wax, wt %: 6.5
Pour pt (ASTM max.), °C.: —3
Kin. vis., @ 40° C., cSt: 3.72
H_2S existent/potential, ppm: <1/<1
Acid value, mg KOH/g (TAN): 0.05
Rvp, lb: 8.5
C_4—, vol %: 3.2

Gasoline
Range, °C.: C_5—85
Yield, vol %: 7.5
Sp gr @ 15° C.: 0.692
RON, clear: 71
RON + 0.5 g Pb/l Pb: 85

Naphtha
Range, °C.: 85-165
Yield, vol %: 17.7
Sp gr @ 15° C.: 0.769
Sulfur, wt %: 0.003
P/N/A, wt %: 42/34/24

Kerosine
Range, °C.: 165-235
Yield, vol %: 13.5
Sp gr @ 15° C.: 0.806
Sulfur, wt %: 0.01
Smoke pt, mm: 23
Aromatics, vol %: 21

Gas oil
Range, °C.: 235-300
Yield, vol %: 12.9
Sp gr @ 15° C.: 0.840
Sulfur, wt %: 0.05
Cetane index: 52
Cloud pt, °C.: —19

Gas oil
Range, °C.: 300-350
Yield, vol %: 9.2
Sp gr @ 15° C.: 0.860
Sulfur, wt %: 0.25
Cetane index: 57.5
Cloud pt, °C.: +6
Kin. vis., cSt @ 40° C.: 6.36

Residue
Range, °C.: 350+
Yield, vol %: 36.5
Sp gr @ 15° C.: 0.913
Sulfur, wt %: 0.55
Wax, wt %: 13
Pour pt, °C.: +36
Kin. vis., cSt @ 40° C.: 51.8
@ 100° C.: 13.5
Acid value 0.08
Asphaltenes, wt %: 0.05
V/Ni, ppm: 4/1.5

Note: This is assay of unblended Brent crude loaded at offshore SPAR.

Brent Blend, U.K. North Sea

Sullom Voe Terminal, Shetlands

Crude
Gravity, °API: 38.0
Vis., cSt @ 20° C.: 5.67
@ 37.8° C: 3.64
Pour pt, °C.: —15
Rvp, psig: 12.8
Sulfur, wt %: 0.38
Wax, wt %: 5.2
Asphaltenes, wt %: 0.26
V/Ni/Fe, ppm: 3.8/0.80/0.10

Light naphtha
Range, °C.: C_5—75
Yield, vol %: 6.2
Gravity, °API: 78.3
RON, clear: 72.0
Paraffins, wt %: 79.2
Olefins, wt %: Nil
Naphthenes, wt %: 16.8
Aromatics, wt %: 4.0

Naphtha
Range, °C.: C_5—165
Yield, vol %: 24.5
Gravity, °API: 60.1
Sulfur, ppm: 15
P/O/N/A, wt %: 59.0/Nil/33.0/8.0

Kerosine
Range, °C.: 165-235
Yield, vol %: 12.6
Gravity, °API: 45.0
Sulfur, wt %: 0.043
Smoke pt, mm: 26
Freeze pt, °C.: —56
Aromatics, vol %: 17.9

Gas oil
Range, °C.: 165-350
Yield, vol %: 33.3
Gravity, °API: 39.1
Sulfur, wt %: 0.14
Cetane index: 53.0
Pour pt, °C.: —21
Vis., cSt @ 37.8° C.: 2.37
@ 50° C.: 1.92
Aniline pt, °C.: 66.8

Gas oil
Range, °C.: 235-350
Yield, vol %: 20.7
Gravity, °API: 35.7
Sulfur, wt %: 0.19
Cetane index: 54.0
Pour pt, °C.: —12
Vis., cSt @ 37.8° C: 3.79
@ 50° C.: 2.94
Aniline pt, °C.: 71.4

Vaccum gas oil
Range, °C.: 350-550
Yield, vol %: 28.3
Gravity, °API: 26.1
Sulfur, wt %: 0.57
Vis., cSt @ 100° F.: too waxy
Pour pt, °C.: +39
Con. carbon, wt %: 0.29
V/Ni/Fe, ppm: 0.05/0.02/0.14
UOP K factor: 12.3

Residue
Range, °C. 550+
Yield, vol %: 10.3
Gravity, °API: 11.5
Sulfur, wt %: 1.35
Vis., cSt @ 37.8° C.: too waxy
Wax content, wt %: 10.1
Pour pt, °C.: +42
Con. carbon, wt %: 15.7
V/Ni/Fe, ppm: 25/5.7/0.96

Note: Analysis run on sample from tanker at Sullom Voe mid October 1981. Contributors to Brent Blend in early 1983 were North and South Cormorant, Brent, Dunlin, Thistle, and Murchison.

Buchan, U.K. North Sea

CALM in producing area

Crude
Gravity, °API: 33.7
Sulfur, wt %: 0.84
Vis., cSt @ 20° C.: 20.37
Pour pt, °C.: 6
Carbon residue, wt %: 5.0
Total C_1—C_4, yield, wt %: 1.50
V/Ni, ppm wt %: 19/4

Gasoline
Range (TBP), °C.: C_5—95
Yield, vol %: 9.45
Paraffins, wt %: 71.2
Naphthenes, wt %: 24.5
Aromatics, wt %: 4.3

Naphtha
Range, °C: C_5—149
Yield, vol %: 19.9
Sulfur, wt %: 0.0009
P/N/A, wt %: 58.1/31.9/10.0

Kerosine
Range, °C.: 149-232
Yield, vol %: 14.45
Density @ 15° C., kg/l: 0.7965
Sulfur, wt %: 0.037
Aromatics, vol %: 18.8
Smoke pt, mm: 24
Aniline pt, °C.: 54.9
Diesel index: 60
Cetane index: 45

Gas oil
Range, °C.: 232-342
Yield, vol %: 20.55
Density @ 15° C., kg/l: 0.8465
Sulfur, wt %: 0.43
Vis., cSt @ 50° C.: 2.72
Pour pt, °C: —15
Aniline pt, °C: 68.0
Diesel index: 55
Cetane index: 54

Gas oil
Range, °C: 342-369
Yield, vol %: 4.2
Sulfur, wt %: 0.93
Pour pt: °C.: 15
Aniline, pt, °C.: 74.9
Diesel index: 50
Cetane index: 57

Gas oil
Range, °C.: 369-509
Yield, vol %: 20.15
Density @ 15° C., kg/l: 0.9055
Sulfur, wt %: 1.06
Vis., cSt @ 60° C.: 21.1
  @ 100° C.: 6.76
Wax, wt %: 12.5
Aniline pt, °C.: 84.6

Residue
Range, °C.: 342+
Yield, vol %: 43.25
Density @ 15° C., kg/l: 0.950
Sulfur, wt %: 1.56
Vis., cSt @ 50° C.: 304
Pour pt, °C.: 36
Carbon residue, wt %: 10.5
V/Ni, wt ppm: 39/8
V/Ni, wt ppm: (509+ °C.): 84/18
Sulfur, wt % (509+ °C.): 2.17

Cormorant, North, U.K. North Sea

Brent system to Sullom Voe

Crude
Gravity, °API: 34.9
Density @ 15° C., kg/l: 0.850
Sulfur, wt %: 0.71
Pour pt, °C.: +12
Kin. vis., @ 40° C., sq mm/sec: 5.76
Acid value, mg KOH/g (TAN): <0.05
C_4 –, vol %: 2.6

Gasoline
Range, °C.: C_5—85
Yield, vol %: 7.0
Density @ 15° C.: 0.677
RON, clear: 69
RON + 0.5 g Pb/l: 84

Naphtha
Range, °C.: 85-165
Yield, vol %: 14.5
Density @ 15° C.: 0.759
Paraffins, wt %: 49
Naphthenes, wt %: 39
Aromatics, wt %: 20

Kerosine
Range, °C.: 165-235
Yield, vol %: 11.7
Density @ 15° C: 0.804
Sulfur, wt %: 0.04
Smoke pt, mm: 24
Aromatics, vol %: 20

Gas oil
Range, °C.: 235-300
Yield, vol %: 12.5
Density @ 15° C.: 0.837
Sulfur, wt %: 0.24
Cetane index: 53
Cloud pt, °C.: —23

Gas oil
Range, °C: 300-350
Yield, vol %: 9.4
Density @ 15° C.: 0.860
Sulfur, wt %: 0.56
Cetane index: 58
Cloud pt, °C.: +8
Kin. vis., @ 40° C., sq mm/sec: 5.92

Residue
Range, °C.: 350+
Yield, vol %: 42.7
Density @ 15° C.: 0.916
Sulfur, wt %: 0.56
Wax, wt %: 12
Pour pt, °C.: +36
Kin. vis., @ 60° C., sq mm/sec: 101
  @ 100° C.: 20.0
Acid value: 0.05
Asphaltenes, wt %: 0.66
Con. carbon, wt %: 5.4
V/Ni, ppm: 23/11

Note: This was designated a provisional assay in early 1983.

Cormorant, South (Cormorant "A"), U.K. North Sea

Brent system to Sullom Voe

Crude
Gravity, °API: 35.7
Density @ 15° C. (kg/l): 0.846
Sulfur, wt %: 0.56
Pour pt, °C.: —6
Kin. vis., @ 40° C. sq mm/sec: 5.0
Acid value, mg KOH/g (TAN): 0.05
C_4—, vol %: 2.8

Gasoline
Range, °C.: C_5—85
Yield, vol %: 7.5
Density @ 15° C.: 0.679
RON, clear: 71
RON + 0.5 g Pb/l: 85

Naphtha
Range, °C.: 85-165
Yield, vol %: 15.4
Density @ 15° C.: 0.764
Sulfur, wt %: 0.001
Paraffins, wt %: 44
Naphthenes, wt %: 39
Aromatics, wt %: 17

Kerosine
Range, °C.: 165-235
Yield, vol %: 12.9
Density @ 15° C.: 0.806
Sulfur, wt %: 0.03
Smoke pt, mm: 21
Aromatics, vol %: 21

Gas oil
Range, °C.: 235-300
Yield, vol %: 13.4
Density @ 15° C.: 0.840
Sulfur, wt %: 0.16
Cetane index: 51.5
Cloud pt, °C.: —18

Gas oil
Range, °C.: 300-350
Yield, vol %: 7.9
Density @ 15° C.: 0.863
Sulfur, wt %: 0.49
Cetane index: 52
Cloud pt, °C.: +5
Kin. vis., @ 40° C., sq mm/sec: 6.27

Residue
Range, °C.: 350+
Yield, vol %: 40.5
Density @ 15° C.: 0.931
Sulfur, wt %: 1.06
Wax, wt %: 10
Pour pt, °C.: 36
Kin. vis., @ 60° C., sq mm/sec.: 81.1
  @ 100° C.: 16.1
Acid value: 0.1
Asphaltenes, wt %: 0.55
V/Ni, ppm: 3/21

Dan, Denmark North Sea

Contributor to Gorm Blend

Crude
Gravity, °API: 30.4
Sulfur, wt %: 0.34
Vis., cSt @ 40° C.: 8.90
Pour pt, °F.: <-45
C_4 & lighter, vol %: 0.8

Light gasoline
Range,° F.: C_5—200
Yield, vol %: 5.8%
Density, kg/l: 0.714
Sulfur, wt %: 0.002
RON, clear: 80.0

Naphtha
Range, °F.: 200-405
Yield, vol %: 20.3
Density, kg/l: 0.791
Sulfur, wt %: 0.05
RON, clear: 63.7

Light gas oil
Range, °F.: 405-650
Yield, vol %: 26.6
Density, kg/l: 0.868
Sulfur, wt %: 0.19
Pour pt, °F.: —45

Heavy gas oil
Range, °F.: 650-1,000
Yield, vol %: 30.0
Density, kg/l: 0.920
Sulfur, wt %: 0.42
Pour pt, °F.: 60
Vis., cSt @ 50° C.: 44.2

Atmospheric resid
Range, °F.: 650+
Yield, vol %: 46.5

Density, kg/l: 0.942
Sulfur, wt %: 0.55
Pour pt, °F.: 45
Vis., cSt @ 50° C.: 269
Carbon residue, wt %: 5.0

Vacuum residue
Range, °F.: 1,000+
Yield, vol %: 16.5
Density, kg/l: 0.977
Sulfur, wt %: 0.70
Pour pt, °F.: 100
Vis., cSt @ 100° C.: 326

Dunlin, U.K. North Sea

Brent system to Sullom Voe

Crude
Gravity, °API @ 60° F.: 34.9
Sulfur, wt %: 0.39
Wax, wt %: 5.0
Pour pt (ASTM max.), °C.: +6
Kin. vis., cSt @ 40° C.: 4.92
C_4—, vol %: 2.3

Gasoline
Range, °C.: C_5—85
Yield, vol %: 6.8
Sp gr @ 15° C.: 0.682
RON, clear: 69

Naphtha
Range, °C.: 85-165
Yield, vol %: 15.2
Sp gr @ 15° C.: 0.761
P/N/A, wt %: 42/43/15

Kerosine
Range, °C.: 165-235
Yield, vol %: 11.8
Sp gr @ 15° C.: 0.809
Sulfur, wt %: 0.025
Smoke pt, mm: 22
Aromatics, vol %: 21

Gas oil
Range, °C.: 235-300
Yield, vol %: 13.0
Sp gr @ 15° C.: 0.846
Sulfur, wt %: 0.13
Cetane index: 50
Cloud pt, °C.: —25

Gas oil
Range, °C.: 300-350
Yield, vol %: 10.0
Sp gr @ 15° C.: 0.864
Sulfur, wt %: 0.32
Cetane index: 56
Cloud pt, °C.: —1
Kin. vis., cSt @ 40° C.: 6.3

Residue
Range, °C.: 350+
Yield, vol %: 41.2
Sp gr @ 15° C.: 0.930
Sulfur, wt %: 0.74
Wax, wt %: 10
Pour pt, °C.: +33
Vis. kin., cSt @ 60° C.: 82.4
@ 100° C.: 18.3
Acid value: 0.2
Asphaltenes, wt %: 0.24
V/Ni, ppm wt %: 5/2

Ekofisk, Norway North Sea

Seal Sands, Teesside, U.K. terminal

Crude
Gravity, °API: 43.4
Sulfur, wt %: 0.14
Pour pt, °F.: 10
Vis., SUS @ 70° F.: 36.1
Rvp, psig: 5.0
Yield, C_1—C_5, wt %: 6.43

Gasoline
Range, °F.: Ibp—176
Yield, vol %: 11.9
RON, clear: 66

Naphtha
Range, °F.: 176-302
Yield, vol %: 20.2
Gravity, °API: 57.9
Paraffins, vol %: 53.1
Naphthenes, vol %: 36.8
Aromatics, vol %: 10.1
Sulfur, ppm: 3

Kerosine
Range, °F.: 302-400
Yield, vol %: 10.6
Gravity, °API: 48.7
Total sulfur, wt %: 0.002
Aniline pt, °F.: 137
Smoke pt, °F.: 23
Freezing pt, °F.: —85

Gas oil
Range, °F.: 400-662
Yield, vol %: 23.4
Gravity, °API: 38.0
Vis., cSt @ 100° F.: 3.01
Pour pt, °F.: 0
Aromatics, vol %: 17
Total sulfur, wt %: 0.07
Aniline pt, °F.: 162
Diesel index: 62

Gas oil
Range, °F.: 302-707
Yield, vol %: 37.3
Gravity, °API: 40.2
Pour pt, °F.: 5

Heavy gas oil
Range, °F.: 707-977
Yield, vol %: 13.2
Gravity, °API: 25.0
Vis., cSt @ 122° F.: 34.05
Pour pt, °F.: 97
Total sulfur, wt %: 0.25
Con. carbon, wt %: 0.047
Aniline, °F.: 200.5
V/Ni/Fe, ppm: 0.8/0.3/0.3

Residue
Range, °F.: 707+
Yield, vol %: 25.2
Gravity, °API: 20.9
Vis., SUS @ 212° F.: 117.2
Pour pt, °F.: 97
Sulfur, wt %: 0.40
Con. carbon, wt %: 4.3
V/Ni/Fe, ppm: 0.4/5.7/1.2

Note: Seven fields contribute to the Ekofisk Blend, which this assay represents. They are Ekofisk, West Ekofisk, Cod (pure gas condensate), Tor, Eldfisk, Edda, and Albuskjell. Condensate is not included in gasoline and naphtha blends listed.

Flotta, U.K. North Sea

Flotta terminal, Orkney Islands

Crude
Gravity, °API: 35.7
Sulfur, wt %: 1.14
Vis., cSt @ 40° F.: 30.8
@ 104° F.: 4.38
Pour pt, °F.: 21.0
C_4 & lighter, vol %: 4.3
Rvp @ 100° F., psi: 9.1

Naphtha
Range, °F.: C_5-149
Yield, vol %: 5.0
Sulfur, wt %: 0.001
Paraffins, vol %: 94.5
Naphthenes, vol %: 3.5
Aromatics, vol %: 1.5
RON, clear: 73.0
RON + 0.4 g Pb/l: 86.0
Rvp @ 100° F., psi: 18.2

Naphtha
Range, °F.: 149-302
Yield, vol %: 14.9
Gravity, °API: 59.9
Sulfur, wt %: 0.001
P/N/A, vol %: 66.0/27.5/16.0
RON, clear: 58.0

Naphtha
Range, °F.: 302-356
Yield, vol %: 5.6
Gravity, °API: 50.0
Sulfur, wt %: 0.04
Rvp @ 100° F., psi: 0.6
P/N/A, vol %: 49.5/30.5/19.5
Smoke pt, mm: 23
Freeze pt, °F.: −76

Kerosine
Range, °F.: 356-455
Yield, vol %: 8.0
Gravity, °API: 44.1
Sulfur, wt %: 0.11
Vis., cSt @ 104° F.: 1.23
Aromatics, vol %: 23.0
Smoke pt, mm: 20.5
Freeze pt, °F.: −48
Aniline pt, °F.: 129
Cloud pt, °F.: −66

Gas oil
Range, °F.: 455-572
Yield, vol %: 11.8
Gravity, °API: 37.0
Sulfur, wt %: 0.51
Vis., cSt @ 104° F.: 2.3
Aromatics, vol %: 28.0
Aniline pt, °F.: 141
Cloud pt, °F.: −10

Gas oil
Range, °F.: 572-650
Yield, vol %: 8.4
Gravity, °API: 32.5
Sulfur, wt %: 1.05
Vis., cSt @ 104° F: 4.78
Aromatics, vol %: 36.0
Aniline pt, °F.: 157
Cloud pt, °F.: 29

Gas oil
Range, °F.: 650-1,000
Yield, vol %: 28.5
Gravity, °API: 23.2
Sulfur, wt %: 1.69
Vis., cSt @ 122° F.: 25.8
Pour pt, °F.: 91
Aniline, pt °F.: 171
Con. carbon residue, wt %: 0.29
V/Ni/Fe, ppm: <1/1/2

Residue
Range, °F.: 650+
Yield, vol %: 42.0
Gravity, °API: 18.3
Sulfur wt %: 2.08
Vis., cSt @ 104° F.: 220
@ 122° F.: 127
Pour pt, °F.: 86
Aniline pt °F.: 173
Con. carbon, wt %: 5.9
V/Ni/Fe: <3/7/3

Note: Flotta is a blend made up of Piper, Claymore, and Tartan crudes. Tartan appears in this section while Piper and Flotta (before introduction of Tartan) are in OGJ, Dec. 3, 1979, p. 102.

Forties, U.K. North Sea

Hound Point terminal, Firth of Forth

Crude
Gravity, °API: 36.6
Sulfur, wt %: 0.30
Vis., cSt @ 10° C.: 9.6
@ 21.1° C.: 6.81
Pour pt, °C.: −3
Wax, wt %: 7.0
Carbon residue, wt %: 2.2
Asphaltenes, wt %: 0.2
V/Ni, ppm wt: 3/2
Watson K factor: 11.9
C_1-C_4, wt %: 2.74

Gasoline
Range (TBP), °C.: C_5-95
Yield, vol %: 9.23
Sulfur, wt %: <0.001
RON, clear: 69.5
RON + 0.44 ml TEL/l: 83
P/N/A, wt %: 71.1/25.7/3.2

Naphtha
Range, °C.: C_5-149
Yield, vol %: 20.02
Density @ 15° C., kg/l: 0.723
Sulfur, wt %: <0.001
RON, clear: 62
RON + 0.44 ml TEL/l: 77.5
P/N/A, wt %: 54.9/35.8/9.3

Kerosine
Range, °C.: 149-232
Yield, vol %: 14.50
Density @ 15° C., kg/l: 0.7995
Sulfur, wt %: 0.010
Aromatics, vol %: 19.5
Smoke pt, mm: 24
Cold test, °C.: −58
Aniline pt, °C.: 54
Diesel index: 59
Cetane index: 44

Gas oil
Range, °C.: 232-342
Yield, vol %: 20.92
Density @ 15° C., kg/l: 0.852
Sulfur, wt %: 0.14
Vis., cSt @ 37.8° C.: 3.5
@ 50° C.: 2.7
Cloud pt, °C.: −15
Pour pt, °C.: −15
Aniline pt, °C.: 67
Diesel index: 53
Cetane index: 52

Residue
Range, °C.: 342+
Yield, vol %: 40.96
Density @ 15° C., kg/l: 0.9265
Sulfur, wt %: 0.61
@ 50° C: 102
Pour pt, °C.: 33
Wax, wt %: 14.3
Carbon residue, wt %: 4.8
Asphaltenes, wt %: 0.5
V/Ni, ppm wt %: 7/4

FCC feed
Range, °C.: 369-509
Yield, vol %: 20.38
Density @ 15° C., kg/l: 0.9045
Sulfur, wt %: 0.44
Vis., cSt @ 37.8° C.: 45.6
Total nitrogen, ppm wt: 960
Aniline pt, °C.: 88

Note: Assay based on analyses of production crude samples obtained at rates of up to 400,000 b/d.

Fulmar, U.K. North Sea

SBM in producing area

Crude
Gravity, °API: 39.3
Density @ 15° C., kg/l: 0.828
Sulfur, wt %: 0.26
Pour pt, °C.: −12
Kin. vis., @ 40° C., sq mm/sec: 2.55
Acid value, mg KOH/g (TAN): 0.06
Yield C_4-, vol %: 2.7

Gasoline
Range, °C.: C_5-85
Yield, vol %: 19.5
Density @ 15° C.: 0.666
RON, clear: 71
RON + 0.5 g Pb/l: 85

Naphtha
Range, °C.: 85-165
Yield, vol %: 19.5
Density @ 15° C.: 0.757
Sulfur, wt %: 0.001
Paraffins, wt %: 55
Naphthenes, wt %: 26
Aromatics: 19

Kerosine
Range, °C.: 165-235
Yield, vol %: 15.7
Density @ 15° C.: 0.804
Sulfur, wt %: 0.02
Smoke pt: 23
Aromatics, vol %: 23

Gas oil
Range, °C.: 235-300
Yield, vol %: 12.2
Density @ 15° C.: 0.839
Sulfur, wt %: 0.06
Cetane index: 51.5

Gas oil
Range, °C.: 300-350
Yield, vol %: 9.5
Density @ 15° C.: 0.856
Sulfur, wt %: 0.26
Cetane index: 60
Cloud pt, °C.: +3
Kin. vis., @ 40° C., sq mm/sec: 5.70

Residue
Range, °C.: 350+
Yield, vol %: 33.1
Density @ 15° C.: 0.916
Sulfur, wt %: 0.56
Pour pt, °C.: +33
Kin. vis., @ 60° C.: sq mm/sec: 44.1
@ 100° C.: 11.3
Acid value: 0.08
Asphaltenes, wt %: 1.8
V/Ni, ppm: 5/1

Note: This has been designated a tentative assay.

Gorm, Denmark North Sea

SBM in producing area

Crude
Gravity, °API: 33.9
Sulfur, wt %: 0.23
Vis., cSt @ 40° C.: 5.44
Pour pt, °F.: −35
C_4 & lighter, vol %: 1.6

Light gasoline
Range, °F: C_5-300
Yield, vol %: 19.7
Density, kg/l: 0.729
Sulfur, wt %: 0.001
P/N/A vol %: 53/40/7

Naphtha
Range, °F.: 300-400
Yield, vol %: 10.0
Density, kg/l 0.800
Sulfur, wt %: 0.026
Smoke pt, mm: 23
Freezing pt, °F.: < −94
Aniline pt, °F.: 120
P/N/A vol %: 32/47/21

Kerosine
Range, °F.: 400-500
Yield, vol %: 12.1
Density, kg/l: 0.841
Sulfur, wt %: 0.065
Smoke pt, mm: 16
Freezing pt, °F.: −47
Cloud pt, °F.: −50
Pour pt, °F.: −60
Aniline pt, °F.: 134

Diesel oil
Range °F.: 500-650
Yield, vol %: 15.9
Density, kg/l: 0.865
Sulfur, wt %: 0.16
Cloud pt, °F.: 16
Pour pt, °F.: 20
Aniline pt., °F.: 155

Gas oil
Range, °F: 650-815
Yield, vol %: 15.0
Density, kg/l: 0.903
Sulfur, wt %: 0.30
Nitrogen, wt %: 0.08
Pour pt, °F.: 70
Aniline pt., °F.: 176
Vis., cSt @ 50° C.: 19.9

Heavy gas oil
Range, °F.: 815-1,000
Yield, vol %: 10.8
Density, kg/l: 0.924
Sulfur, wt %: 0.37
Nitrogen, wt %: 0.18
Pour pt, °F.: 100
Aniline pt, °F.: 196
Vis cSt @ 50° C.: 110

Residuum
Range, °F: 1,000+
Yield, vol %: 14.9
Density, kg/l: 0.972
Sulfur, wt %: 0.59
Nitrogen, wt %: 0.60
Hydrogen, wt %: 11.2
Carbon residue, wt %: 9.6
Vis., cSt @ 100° C.: 300
V/Ni, ppm: 65/40

Note: Subsequent to this assay Gorm has been joined by crude from Dan field (13% of blend in late 1982) and Skjold field (6% of blend). Skjold is marginal field. Dan has gravity of 30.4° API & sulfur content of 0.34 wt %.

Gullfaks, Norway North Sea

Block 34/10—Not yet in production

Crude
Gravity, °API: 28.6
Sp gr, 60/60: 0.8838
Sulfur, wt %: 0.44
Pour pt, °F.: −50
Vis., cSt @ 100° F.: 10.14

Gasoline
Range, °C.: 20-70
Yield, wt %: 0.8
Sp gr, 60/60: 0.6948
Sulfur, wt ppm: 100
RON, clear: 82.9

Paraffins, wt %: 66
Naphthenes, wt %: 32.1
Aromatics, wt %: 1.9

Gasoline
Range, °C.: 70-100
Yield, wt %: 2.6
Sp gr, 60/60: 0.7433
Sulfur, wt ppm: 500
P/N/A, wt %: 34.8/58.3/6.9

Gasoline
Range, °C.: 100-150
Yield, wt %: 7.0
Sp gr, 60/60: 0.7808
Sulfur, wt %: 0.0023
P/N/A, wt %: 33/44.6/22.4
Yield, wt %: 7.0

Gasoline
Range °C.: 150-190
Yield, wt %: 6.6
Sp gr, 60/60: 0.8056
Sulfur, wt %: 0.0116
P/N/A, wt %: 42.5/32.3/25.2

Kerosine
Range, °C.: 150-205
Yield, wt %: 9.2
Sp gr, 60/60: 0.8108
Sulfur, wt %: 0.0148
Smoke pt, mm: 20
Diesel index: 48
Vis., cSt @ 100° F.: 1.03

Gas oil
Range, °C.: 205-343
Yield, wt %: 28.4
Sp gr, 60/60: 0.8676
Sulfur, wt %: 0.1935
Diesel index: 43
Vis., cSt @ 100° F.: 3.61

Residue
Range, °C.: 343+
Yield, wt %: 51.8
Gravity, °API: 19.3
Sp gr, 60/60: 0.9382
Sulfur, wt %: 0.77
Con. carbon, wt %: 3.8
Vis., cSt @ 100° F.: 351
Pour pt, °F.: 15

Note: This is a preliminary assay.

Magnus, U.K. North Sea

Ninian system to Sullom Voe (hookup slated mid 1983)

Crude
Gravity, °API: 39.3
Sulfur, wt %: 0.28
Pour pt, °C.: −3
Vis., cSt @ 21.1 °C.: 4.56
Carbon residue, wt %: 1.6
V/Ni, ppm wt %: 4/<2
Total C_1-C_4, wt %: 3.15

Gasoline
Range (TBP), °C.: C_5-95
Yield, wt %: 9.8

Naphtha
Range, °C.: 95-175
Yield, wt %: 16.75
P/N/A, wt %: 39.2/41.3/19.5

Naphtha
Range, °C.: C_5-149
Yield, wt %/vol %: 21.45/24.25
Density @ 15° C., kg/l: 0.733
Sulfur, wt %: 0.0015
P/N/A, wt %: 52.9/33.8/13.3

Kerosine
Range, °C.: 149-232
Yield, wt %/vol %: 15.0/15.5
Density @ 15 °C., kg/l: 0.8015
Sulfur, wt %: 0.0085
Acidity, mg KOH/g: 0.03
Aromatics, vol %: 19.9
Cold test, °C.: −53.5
Aniline pt, °C.: 54.2
Cetane index: 44

Gas oil
Range, °C.: 232-342
Yield, wt %/vol %: 21.4/20.9
Density @ 15° C., kg/l: 0.8485
Sulfur, wt %: 0.15
Pour pt, °C.: −15
Acidity, mg KOH/g: 0.05
Aniline pt, °C.: 68.0
Diesel index: 54
Cetane index: 53

Gas oil
Range, °C.: 342-369
Yield, wt %/vol %: 4.4/4.15
Density @ 15° C., kg/l: 0.8755
Sulfur, wt %: 0.39
Vis., cSt @ 50° C.: 6.85
Pour pt, °C.: 12
Aniline pt, °C.: 77.1
Diesel index: 51
Cetane index: 58

Gas oil
Range, °C.: 369-509
Yield, wt %/vol %: 21.15/19.45
Density @ 15° C., kg/l: 0.8995
Sulfur, wt %: 0.43
Vis., cSt @ 98.9° C.: 6.27
Wax, wt %: 17.5
Aniline pt, °C.: 89.1

Residue
Range, °C.: 342+
Yield, wt %/vol %: 39.0/35.15
Density @ 15° C., kg/l: 0.918
Sulfur, wt %: 0.57
Vis., cSt @ 50° C.: 69
Carbon residue, wt %: 4.5
Asphaltenes, wt %: 0.35
V/Ni, ppm wt: 11/4

Residue
Range, °C.: 509+
Yield, wt %/vol %: 13.45/11.55
Density @ 15° C., kg/l: 0.965
Sulfur, wt %: 0.80
Vis., cSt @ 98.9 °C.: 122
Carbon residue, wt %: 12.0
V/Ni, ppm wt %: 30/7

Note: Preliminary guide to Magnus, which was not in production when assay sample obtained.

Maureen, U.K. North Sea

Not yet in production. Production expected late 1983 or early 1984.

Crude
Gravity, °API @ 60° F.: 35.8/35.3*
Sulfur, wt %: 0.55
Pour test, °F.: +45
Vis., SUS @ 70° F.: 78.92/81.79*
C_4−, vol %: 2.6

Gasoline
Range, °F.: 60-200
Yield, vol %: 9.0
Sulfur, wt %: 0.002
RON, clear: 72.5
RON + 3 ml TEL/gal: 91.3

Naphtha
Range, °F.: 60-400
Yield, vol %: 27.9
P/N/A, vol %: 57.32/31.96/10.72
Sulfur, wt %: 0.002
RON, clear: 52.8
RON + 3 ml TEL/gal: 77.8

Kerosine
Range, °F.: 400-500
Yield, vol %: 12.3
Gravity, °API: 39.7
Vis., SUS @ 100° F.: 32.15
Freeze pt, °F: −42
P/N/A, vol %: 37.8/40.1/22.1
Sulfur, wt %: 0.05
Aniline pt, °F.: 141.0
Smoke pt, mm: 20

Gas oil
Range, °F.: 500-650
Yield, vol %: 15.6
Gravity, °API: 34.0
Vis., SUS @ 100° F.: 42.34
Pour pt, °F.: +20
P/N/A, vol %: 34.3/39.8/25.9
Sulfur, wt %: 0.17
Aniline pt, °F.: 163.3
Cetane index: 55.5

Topped crude
Range, °F.: 650+
Yield, vol %: 41.6
Gravity, °API: 19.8
Vis., SUS @ 210° F.: 101.05
Pour pt, °F.: +90
Sulfur, wt %: 0.64
Rams. car. residue, wt %: 5.07
V/Ni, ppm 9.5/4.5

Note: The inspection of fractions is based on composite of three drillstem test samples.
* Results from two samples.

Montrose, U.K. North Sea

SBM in producing area

Crude
Gravity, °API: 40.1
Sulfur, wt %: 0.23
Rvp, psi: 4.0
Pour pt, °F.: 15
Neut. no., mg KOH/g: 0.28
Rams. carbon, wt %: 1.3
Vis kin., cSt @ 68° F.: 4.96
@ 100° F.: 3.27
V/Ni, ppm: 2/2
C_4−, vol %: 2.2

Gasoline
Range (TBP), °F.: C_5-200
Yield, vol %: 12.3
Sulfur, wt %: 0.002
P/N/A, vol %: 70.0/27.1/2.9
RON, clear: 71.4
RON + 3 cc TEL/gal: 89.5

Naphtha
Range, °F.: 200-320
Yield, vol %: 15.0
Gravity, °API: 55.5
Sulfur, wt %: 0.001
Charac. factor: 11.84
P/N/A vol %: 56.2/33.5/10.3
RON, clear: 42.8
RON + 3 cc TEL/gal: 68.0

Kerosine
Range, °F.: 320-400
Yield, vol %: 8.9
Gravity, °API: 47.7
Sulfur, wt %: 0.005
Aniline pt, °F.: 137.7
Diesel index: 65.7

Cetane index: 45.1
Freeze pt, °F.: −75
Smoke pt, mm: 24

Gas oil
Range, °F.: 400-650
Yield, vol %: 25.4
Gravity, °API: 38.2
Sulfur, wt %: 0.082
Aniline pt, °F.: 161.1
Diesel index: 61.6
Cetane index: 55.1
Cloud pt, °F.: 10
Pour pt, °F.: 4
Vis., SUS @ 100° F.: 35.2
Total nitrogen, wt %: 0.009

Residue
Range, °F.: 650+
Yield, vol %: 36.6
Gravity, °API: 23.7
Sulfur, wt %: 0.5
Pour pt, °F.: 80
Total nitrogen, wt %: 0.136
Rams. carbon, wt %: 3.3
Vis., SUS @ 122° F.: 334.6
@ 210° F.: 67.1
V/Ni, ppm: 4/4

Murchison, U.K. & Norway, North Sea

Brent system to Sullom Voe terminal

Crude
Gravity, °API: 38.0
Kin. vis., @ 100° F.: 3.60
Con. carbon residue, wt %: 1.1
Sulfur, wt %: 0.27
V/Ni, ppm: 2.5/0.7
Pour pt, °C.: +7.2
Rvp, psi: 9.0
C_4 & lighter, vol %: 3.0

Naphtha
Range (TBP), °F.: 86-375
Yield, vol %: 31.2
Paraffins, vol %: 55.5
Naphthenes, vol %: 32.8
Sulfur, wt %: <0.01

Kerosine
Range, °F.: 375-520
Yield, vol %: 13.5
Gravity, °API: 42.2
Sulfur, wt %: 0.02
Aromatics, vol %: 17

Heavy distillate
Range, °F.: 520-700
Yield, vol %: 21.4
Gravity, °API: 34.1
Sulfur, wt %: 0.16

Gas oil
Range, °F.: 700-1,020
Yield, vol %: 21.0
Gravity, °API: 25.8
Sulfur, wt %: 0.43

Residue
Range, °F.: 1,020+
Yield, vol %: 11.9
Gravity, °API: 13.7
Sulfur, wt %: 0.93
Kin. vis. @ 210° F.: 196
Con. carbon residue, wt %: 11.8
V/Ni, ppm: 18/5

Ninian Blend, U.K. North Sea

Ninian system to Sullom Voe terminal

Crude
Gravity °API: 35.6
Sulfur, wt %: 0.43
Vis., cSt @ 40° C.: 5.61
Pour pt, °F.: 35
C_4 & lighter, vol %: 2.6

Light gasoline
Range, °F.: C_5-300
Yield, vol %: 19.9
Density, kg/l: 0.726
Sulfur, wt %: 0.001
Paraffins, vol %: 63
Naphthenes, vol %: 27
Aromatics, vol %: 10

Naphtha
Range, °F.: 300-400
Yield, vol %: 9.3
Density kg/l: 0.788
Sulfur, wt %: 0.006
Smoke pt, mm: 27
Aniline pt, °F.: 128
P/N/A, vol %: 44/40/16

Kerosine
Range, °F.: 400-500
Yield, vol %: 11.1
Density, kg/l: 0.828
Sulfur, wt %: 0.047
Smoke pt, mm: 21
Freeze pt, °F.: −33
Cloud pt, °F.: −40
Pour pt, °F.: −40
Aniline pt, °F.: 143

Diesel oil
Range, °F.: 500-650
Yield, vol %: 14
Density, kg/l: 0.852
Sulfur, wt %: 0.23
Cloud pt, °F.: 20
Pour pt, °F.: 20
Aniline pt, °F.: 164

Gas oil
Range, °F.: 650-815
Yield, vol %: 13.1
Density, kg/l: 0.883
Sulfur, wt %: 0.46
Nitrogen, wt %: 0.05
Pour pt, °F.: 75
Aniline pt, °F: 184
Vis., cSt @ 50° C.: 10.7

Heavy gas oil
Range, °F.: 815-1,000
Yield, vol %: 14.0
Density, kg/l: 0.906
Sulfur, wt %: 0.60
Nitrogen, wt %: 0.10
Pour pt, °F: 110
Aniline pt, °F: 205
Vis., cSt @ 50° C.: 71.3

Residue
Range, °F.: 1,000+
Yield, vol %: 16.0
Density, kg/l: 0.982
Sulfur, wt %: 1.2
Nitrogen, wt %: 0.40
Carbon residue, wt %: 11.7
Vis., cSt @ 100° C.: 291
V/Ni, ppm: 24/4

Note: This assay prepared when Heather field made up of 10% Ninian Blend. Magnus field is scheduled to contribute to Ninian system in mid 1983.

Statfjord, Norway & UK, North Sea

"A" and "B" SPM buoys in producing area

Crude
Gravity, °API: 38.4
Pour pt, °F.: 40
Kin. vis., @ 59° F.: 7.33
Con. carbon residue, wt %: 1.32
Sulfur, wt %: 0.27
Rvp, psi: 5.5
Total nitrogen, ppm: 1.03
V/Ni, ppm: 0.53/1.03
C_5 & lighter, vol %: 5.08

Naphtha
Range (TBP), °F.: 60-100
Yield, vol %: 6.49
Sp gr, 60° F./60° F.: 0.6740
Rvp, psi: 10.3
Paraffins, vol %: 80.1
Naphthenes, vol %: 17.8
Aromatics, vol %: 2.1

Naphtha
Range, °F.: 100-360
Yield, vol %: 22.12
Sp gr 0.7603
P/N/A: 48.9/37.3/13.8
RON, clear: 51.3
RON +3 ml TEL: 74.2
Sulfur, wt %: 0.0037

Kerosine
Range, °F.: 360-503
Yield, vol %: 15.08
P/N/A, vol %: 48.1/34.6/17.2
Freeze pt, °F.: −47
Cloud pt, °F.: −52
Smoke pt, mm: 20
Aniline pt, °F: 142.1
Diesel index: 60
Cetane index: 49
Sulfur, wt %: 0.03

Light gas oil
Range, °F.: 503-710
Yield, vol %: 22.22
Sp gr, 60° F./60° F.: 0.8526
Gravity, °API: 34.5
Pour pt, °F.: 25
Aniline pt, °F.: 166

Heavy gas oil
Range, °F.: 710-946
Yield, vol %: 22.09
Gravity, °API: 25.6
Pour pt, °F.: 105
Kin. vis., cSt @ 100° F.: 66.27
Aniline pt, °F.: 200
Sulfur, wt %: 0.40
Basic nitrogen, ppm: 375
Con. carbon residue, wt %: 0.07

Residue
Range, °F.: 946+
Yield, vol %: 9.84
Gravity, °API: 14.2
Pour pt, °F.: 120
Kin. vis., cSt @ 100° F.: 24,732.61
Sulfur, wt %: 0.74
Total nitrogen, ppm: 1,750
Con. carbon, wt %: 10.58
V/Ni, ppm: 8.1/5.7

Note: This assay is on production from Statfjord "A" platform. Statfjord "B" began operation in November 1982.

Tartan, U.K. North Sea

Flotta system

Crude
Gravity, °API: 41.7
Sulfur, wt %: 0.56
Vis., cSt @ 40° F.: 11.6
Pour pt, °F.: 16
C_4 & lighter, vol %: 3.5
Rvp @ 100° F., psi: 10.2

Naphtha
Range, °F.: C_5-149
Yield, vol %: 5.7
Sulfur, wt %: 0.001
Paraffins, vol %: 97.0
Naphthenes, vol %: 1.5
Aromatics, vol %: 1.0
RON, clear: 70.2

Naphtha
Range, °F.: 149-302
Yield, vol %: 20.0
Gravity, °API: 58.5
Sulfur, wt %: 0.01
P/N/A, vol %: 56.5/25.5/17.5
RON, clear: 56.6

Naphtha
Range, °F.: 302-356
Yield, vol %: 7.1
Gravity, °API: 49.4
Sulfur, wt %: 0.06
P/N/A, vol %: 50/30/19.5

Kerosine
Range, °F.: 356-455
Yield, vol %: 10.8
Gravity, °API: 44.0
Sulfur, wt %: 0.1
Aromatics, vol %: 23.5
Smoke pt, mm: 20
Freeze pt, °F.: −52
Aniline pt, °F.: 135

Gas oil
Range, °F.: 455-572
Yield, vol %: 12.3
Gravity, °API: 37.3
Sulfur, wt %: 0.32
Aromatics, vol %: 28.0
Aniline pt, °F.: 149

Gas oil
Range °F.: 572-650
Yield, vol %: 8.3
Gravity, °API: 34.0
Sulfur, wt %: 0.64
Aromatics, vol %: 32.0
Aniline pt, °F.: 167

Residue
Range, °F.: 650+
Yield, vol %: 32.3
Gravity, °API: 23.1
Sulfur, wt %: 1.22
Vis., cSt @ 122° F.: 55.5
Con. carbon residue, wt %: 2.5
V/Ni/Fe, ppm: 6.0/2.0/4.0

Note: Tartan is part of Flotta Blend.

Thistle, U.K. North Sea

Brent system to Sullom Voe terminal

Crude
Gravity, °API: 37.03
Vis., cSt @ 20° C.: 5.87
@ 37.8° C.: 4.26
Pour pt, °C.: 12
Rvp, psig: 7.5
H_2S, wt %: <0.01
Acid no., mg KOH/g: <0.05
Sulfur, wt %: 0.31
Wax, wt %: 7.7
Asphaltenes, wt %: 0.19
C_4—, wt % on crude (GLC): 0.69

Gasoline
Range, °C.: C_5-85
Yield, vol %/wt %: 7.0/5.6
Density @ 15° C., g/cc: 0.6771
Sulfur, wt %: <0.01
RON, clear/0.5 g TEL per liter: 71.6/84.7
PO/N/A, wt %: 64.0/Nil/25/11.0

Naphtha
Range, °C.: 85-165
Yield, vol %/wt %: 16.6/15.0
Density @ 15° C., g/cc: 0.7547
Sulfur, wt %: <0.01
P/O/N/A, wt %: 44.5/Nil/42.9/12.6

Kerosine
Range, °C.: 165-235
Yield, vol %/wt %: 12.6/11.9
Density @ 15° C., g/cc: 0.7984
Sulfur, wt %: 0.02
Smoke pt, mm: 24
Freeze pt, °C.: −51
Aniline pt, °C.: 58.7
Aromatics, vol %: 15.0

Light gas oil
Range, °C.: 235-300
Yield, vol %/wt %: 12.9/12.9
Density @ 15° C., g/cc: 0.8393
Sulfur, wt %: 0.06
Vis., cSt @ 37.8° C.: 2.46
Cetane index: 49.5
Pour pt, °C.: −24
Cloud pt, °C.: −22
Aniline pt, °C.: 65.9
Con. car. residue (on 10% residue), wt %: 0.004

Heavy gas oil
Range, °C.: 300-350
Yield, vol %/wt %: 9.6/9.8
Density @ 15° C., g/cc: 0.8494
Sulfur, wt %: 0.21
Vis., cSt @ 37.8° C.: 5.47
Cetane index: 58.5
Pour pt, °C.: 0
Cloud pt, °C.: 1
Aniline pt, °C.: 77.9
Con. car. residue (on 10% residue), wt %: 0.039

Residue
Range, °C.: 350+
Yield, vol %/wt %: 39.8/43.8
Density @ 15° C., g/cc: 0.9217
Sulfur, wt %: 0.63
Vis., cSt @ 98.9° C.: 14.77
Pour pt, °C.: 39
Asphaltenes, wt %: 0.95
Con. car. residue, wt %: 4.6
V/Ni, ppm: 7.5/1.9
-30

West African

Bonny Light, Nigeria

Bonny shore terminal and Bonny marine SBM (12 miles offshore in Atlantic)

Crude
Gravity, °API: 36.7
Sulfur, wt %: 0.12
Salt, lb/1,000 bbl: 12
Wax, wt %: 7.5
Carbon residue, wt %: 1.0
V/Ni, ppm wt: <2/3
Vis., cSt @ 37.8° C.: 3.47
Yield C_1—C_4, wt %: 2.10

Naphtha
Range (TBP), °C.: C_5—149
Yield, vol %: 20.85
Sulfur, wt %: 0.002
Watson K factor: 12.2
RON, clear: 68.5
RON + 0.44 ml TEL/l: 81.5
Paraffins, wt %: 42.6
Naphthenes, wt %: 47.6
Aromatics, wt %: 9.8

Kerosine
Range, °C.: 149—232
Yield, vol %: 16.8
Sulfur, wt %: 0.020
Aromatics, vol %: 17
Smoke pt, mm: 21
Freeze pt, °C.: −61
Aniline pt, °C.: 53
Diesel index: 54
Cetane index: 39

Gas oil
Range, °C.: 232—342
Yield, vol %: 27.1
Sulfur, wt %: 0.10
Cloud pt, °C.: −11
Pour pt, °C.: −12
Wax, wt %: 5.5
Aniline pt, °C.: 67
Diesel index: 51
Cetane index: 49

Heavy gas oil
Range, °C.: 369—509
Yield, vol %: 19.6
Sulfur, wt %: 0.22
Vis., cSt @ 37.8° C.: 56.4
Pour pt, °C.: 39
Wax, wt %: 26
Total nitrogen, ppm wt: 1,180
Watson K factor: 11.9
Aniline pt, °C.: 86

Residue
Range, °C.: 342+
Yield, vol %: 32.6
Sulfur, wt %: 0.25
Vis., cSt @ 3.78° C.: 115
Pour pt, °C.: 39
Wax, wt %: 22
Total nitrogen, wt %: 0.24
Carbon residue, wt %: 2.7
V/Ni, ppm wt: 1/9
Watson K factor: 11.85

Note: Numerous fields contribute to Bonny Light and Medium blends, whose qualities are also influenced by national output. Analysis is on sample taken during period of high production.

Bonny Medium, Nigeria

Bonny shore terminal and Bonny marine CALM (12 miles offshore in Atlantic)

Crude
Gravity, °API: 25.2
Sulfur, wt %: 0.23
Vis., cSt @ 37.8 °C.: 12.1
Pour pt, °C.: −27
Carbon residue, wt %: 1.7
V/Ni, ppm wt: <1/7
C_1—C_4 yield, wt %: 0.52

Naphtha
Range (TBP), °C.: C_5—149
Yield, vol %: 6.31
Sulfur, wt %: 0.003
RON, clear: 73.5
RON + 0.44 ml TEL/l: 85.5
Paraffins, wt %: 32.8
Naphthenes, wt %: 54.7
Aromatics, wt %: 12.5

Kerosine
Range, °C.: 149—232
Yield, vol %: 12.85
Sulfur, wt %: 0.038
Aromatics, vol %: 16.5
Smoke pt, mm: 19
Freeze pt, °C.: < −70
Aniline pt, °C.: 49
Diesel index: 44
Cetane index: 32

Gas oil
Range, °C.: 232—343
Yield, vol %: 34.3
Density @ 15° C., kg/l: 0.889
Sulfur, wt %: 0.16
Vis., cSt @ 37.8 °C.: 4.7
Cloud pt, °C.: −32
Pour pt, °C.: −33
Aniline pt, °C.: 55
Diesel index: 36
Cetane index: 38

Heavy gas oil
Range, °C.: 369—509
Yield, vol %: 25.6
Density @ 15° C., kg/l: 0.9405
Sulfur, wt %: 0.31
Vis., cSt @ 37.8° C.: 162
Pour pt, °C.: 24
Total nitrogen, ppm wt: 1,790
Aniline pt, °C.: 72

Residue
Range, °C.: 342 +
Yield, vol %: 45.95
Density @ 15° C., kg/l: 0.953
Sulfur, wt %: 0.37
Vis. @ 37.8 °C.: 515
Pour pt, °C.: 24
Carbon residue, wt %: 3.5
V/Ni, ppm wt: 2/15

Note: See note at end of Bonny Light assay.

Brass River, Nigeria

CALM some 12 miles off mouth of Brass

Crude
Gravity, °API @ 60° F.: 40.9
Sulfur, wt %: 0.09
Pour test, °F.: +35
Vis., SUS @ 70° F.: 38.66
Rvp, psi @ 100° F.: 6.9
Salt, lb/1,000 bbl: 3.8
V/Ni, ppm: 2.0/1.7
C_4 & lighter yield, vol %: 1.9

Gasoline
Range, °F.: 60—200
Yield, vol %: 11.2
Total sulfur, wt %: 0.001
RON, clear: 74 6
RON + 3 ml TEL/gal: 92.2
Rvp, psi: 12.4

Naphtha
Range, °F.: 200—300
Yield, vol %: 16.6
Paraffins, vol %: 44.97
Naphthenes, vol %: 43.52
Aromatics, vol %: 11.51
Total sulfur, wt %: <0.001

Naphtha
Range, °F.: 300—400
Yield, vol %: 11.5
P/N/A, vol %: 45.78/38.45/15.77
Total sulfur, wt %: 0.0087
Aniline pt, °F.: 128.0
Smoke pt, mm: 26

Kerosine
Range, °F.: 400-500
Yield, vol %: 16.9
Freezing pt, °F.: −36
P/N/A, vol %: 45.9/37.2/16.9
Total sulfur, wt %: <0.05
Aniline pt, °F.: 146.2
Smoke pt, mm: 20

Gas oil
Range, °F.: 500—650
Yield, vol %: 15.7
Gravity, °API: 33.9
Vis., SUS @ 100° F.: 41.41
Pour pt, °F.: +30
P/N/A, vol %: 47.0/32.1/20.9
Total sulfur, wt %: 0.06
Aniline pt, °F.: 167.2
Cetane index (determined): 57.4

Residue
Range, °F.: 650 +
Yield, vol %: 26.5
Vis., SUS @ 210° F.: 53.55
Pour pt, °F.: +105
Total sulfur, wt %: 0.14
Rams. carbon residue, wt %: 2.31
V/Ni/Fe, ppm: 6.6/5.7/5.8

Heavy gas oil
Range (vac. flash), °F.: 625—1,100
Yield, vol %: 24.7
Aniline pt, F.: 190.1
Vis., SUS @ 130° F.: 127.55
Pour pt, °F.: +105
Sulfur, wt %: 0.33
Rams. carbon res., wt %: 0.67
V/Ni/Fe, ppm: 0.2/1.2/<0.2
Nitrogen, wt %: 0.139

Cabinda, Angola

CALM in producing area off Malongo terminal, Cabinda

Crude
Gravity, °API: 31.7
Sulfur, wt %: 0.17
Vis., SUS @ 100° F.: 93.5
Pour pt, °F.: +65
C_4 & lighter, vol %: 1.58
Rvp, psi: 3.8
V/Ni, ppm: 2.4/15.9
Salt, lb/1,000 bbl: 18
ASTM, 50% pt, °F.: >590

Light naphtha
Range (TBP), °F.: Ibp—140*
Yield, vol %: 2.18
Sulfur, wt %: 0.024
RON, clear: 77.3

Light naphtha
Range, °F.: 140—170
Yield, vol %: 1.67
Sulfur, wt %: 0.018
Paraffins, vol %: 77.6
Naphthenes, vol %: 21.4
Aromatics, vol %: 1.0
RON, clear: 65.1

Heavy naphtha
Range, °F.: 170—310
Yield, vol %: 9.98
Sulfur, wt %: 0.06
P/N/A, vol %: 50.0/44.8/5.2
Aniline pt, °F.: 134.4

Kerosine
Range, °F.: 310—520
Yield, vol %: 16.27
Gravity, °API: 43.7
Sulfur, wt %: 0.08
Freezing pt, °F.: −42
Aniline pt, °F.: 148.5
Cetane index: 50.8
Smoke pt, mm: 25

Light gas oil
Range, °F.: 520—680
Yield, vol %: 15.83
Gravity, °API: 34.9
Vis., SUS @ 100° F.: 44.4
Sulfur, wt %: 0.14
Pour pt, °F.: +35
Diesel index: 61.2
Cetane index: 60.5

Heavy gas oil
Range (TBP to EFV), °F.: 680—1,000
Yield, vol %: 29.34
Gravity, °API: 25.8
Vis., SUS @ 210° F.: 55.6
Sulfur, wt %: 0.16
Total nitrogen, ppm: 1,400
Pour pt, °F.: +115
Aniline pt, °F.: 210.2
V/Ni, ppm: >0.1/0.4

Residual oil
Range, °F.: 680 +
Yield, vol %: 52.87
Gravity, °API: 20.4
Vis., SUS @ 210° F.: 210
Sulfur, wt %: 0.24
Con. carbon res., wt %: 5.82
Pour pt, °F.: +95
V/Ni, ppm: 4.2/28

*Does not include C_4 and lighter

Djeno Blend, Congo (Brazzaville)

CALM located 3.8 km from Djeno tank farm

Crude
Gravity, °API: 26.87
Vis., cSt @ 10° C.: 220
Pour pt, °C.: +3
Rvp @ 37.8° C., g/sq cm: 290
Total sulfur, wt %: 0.33
Acidity, mg KOH/g: 1.10
UOP charac. factor: 12.0
V/Ni, kg/mg: <1/23
Yield C_1—C_5, vol %: 2.37

Gasoline
Range, °C.: 15—80
Yield, vol %: 2.59
RON, clear: 69.0
Sulfur, wt %: 0.0876
Aromatics, vol %: 1.3

Naphtha
Range, °C.: 80—180
Yield, vol %: 11.86
Paraffins, vol %: 52.5
Naphthenes, vol %: 39.8
Aromatics, vol %: 7.7
Sulfur, wt %: 0.16

Kerosine
Range, °C.: 180—225
Yield, vol %: 5.90
Freezing pt, °C.: −51
Smoke pt, mm: 20
Sulfur, wt %: 0.20
Aromatics, vol %: 12.5

Gas oil
Range, °C.: 225—350
Yield, vol %: 21.88
Pour pt, °C.: −10
Cloud pt, °C.: −7
Sulfur, wt %: 0.17

Heavy gas oil
Range, °C.: 400—550
Yield, vol %: 21.88
Density 15/4 °C.: 0.926
Pour pt, °C.: +39
Vis., cSt @ 50° C.: 185
V/Ni, ppm: <0.5/<1
Sulfur, wt %: 0.25
Nitrogen, pm: 944
Aniline pt, °C.: 95.7
Con. carbon residue, wt %: 0.60

Residue
Range, °C.: 350+
Yield, vol %: 57.42
Density, 15/4 °C.: 0.952
Pour pt, °C.: +30
Vis., cSt @ 50° C.: 1,850
Sulfur, wt %: 0.41

Escravos, Nigeria

CALM in offshore producing area

Crude
Gravity, °API: 36.2
Sulfur, wt %: 0.14
Vis., SUS @ 100° F.: 37.6
Pour pt, °F.: +10
C_4 & lighter, vol %: 2.24
Rvp, lb: 4.3
V/Ni, ppm: 0.3/3.8
Salt, lb/1,000 bbl: 1
Uncondensed gases, vol %: 1.95

Light naphtha
Range (TBP), °F.: lbp—140
Yield, vol %: 2.82
Gravity, °API: 88.0
Sulfur, wt %: 0.015
RON, clear: 82.6

Light naphtha
Range (TBP), °F.: 140—170
Yield, vol %: 1.60
Gravity, °API: 74.5
Sulfur, wt %: 0.009
P/N/A, vol %: 72.0/24.6/3.4
RON, clear: 75.0

Heavy naphtha
Range (TBP), °F.: 170—310
Yield, vol %: 16.13
Gravity, °API: 55.6
Sulfur, wt %: 0.013
P/N/A, vol %: 41.6/46.5/11.9
Aniline pt, °F.: 113.9

Kerosine
Range (TBP), °F.: 310—520
Yield, vol %: 28.55
Gravity, °API: 39.5
Sulfur, wt %: 0.06
Freezing pt, °F.: −51
Aniline pt, °F.: 131.4
Cetane index: 38.5
Smoke pt (ASTM), mm: 15

Light gas oil
Range (TBP), °F.: 520—680
Yield, vol %: 19.17
Gravity, °API: 31.1
Vis., SUS @ 100° F.: 44.9
Sulfur, wt %: 0.19
Pour pt, °F.: +30
Diesel index: 49.9
Cetane index: 47.0

Heavy gas oil
Range (TBP or EFV), °F.: 680—1,000
Yield, vol %: 23.76
Gravity, °API: 22.4
Vis., SUS @ 210° F.: 56.1
Sulfur, wt %: 0.22
Nitrogen (total), ppm: 1,700
Pour pt, °F.: +120
Aniline pt, °F.: 190.0
V/Ni, ppm: >0.1/0.9

Residual oil
Range (TBP or EFV), °F.: 680+
Yield, vol %: 29.78
Gravity, °API: 19.9
Vis., SUS @ 210° F.: 93.5
Sulfur, wt %: 0.27
Con. carbon residue, wt %: 3.72
Pour pt, °F.: +115
V/Ni, ppm: 1.0/11.5

Espoir, Ivory Coast

CALM yoke with permanent floating storage in producing area

Crude
Gravity, °API: 31.4
Sp gr @ 60° F.: 0.8686
Sulfur, wt %: 0.32
Pour test, °F.: +5
Vis., SUS @ 70° F.: 69.78
Rvp @ 100° F., psi: 5.5
Salt lb/1,000 bbl: 15.0
Yield, NC_4 & lighter, vol %: 0.8
V/Ni, ppm: 1.7/5.8

Gasoline
Range, °F.: 60—200
Yield, vol %: 4.5
Total sulfur, wt %: <0.001
RON, clear (calc.): 73.6

Naphtha
Range, °F.: 200—300
Yield, vol %: 10.9
Total sulfur, wt %: 0.0049
Aniline pt, °F.: 118.5

Naphtha
Range, °F.: 300—400
Yield, vol %: 9.4
Paraffins, vol %: 43.42
Naphthenes, vol %: 48.19
Aromatics, vol %: 8.39
Total sulfur, wt %: 0.036
Aniline pt, °F.: 121.5
Smoke pt, mm: 25

Kerosine
Range, °F.: 400—500
Gravity, °API: 36.1
Vis., SUS @ 100° F.: 32.84
Freezing pt, °F.: −56
P/N/A, vol %: 26.3/50.9/22.8
Sulfur, wt %: 0.07
Aniline pt, °F.: 136.1
Smoke pt, mm: 19

Light gas oil
Range, °F.: 500—650
Yield, vol %: 17.1
Gravity, °API: 30.7
Vis., SUS @ 100° F.: 45.28
Pour pt, °F.: +10
P/N/A, vol %: 28.3/49.8/21.9
Total sulfur, wt %: 0.22
Aniline pt, °F.: 157.4

Vacuum gas oil
Range, °F.: 620—1,000
Yield, vol %: 25.7
Gravity, °API: 23.3
Aniline pt, °F.: 192.1
Vis., SUS @ 130° F.: 152.01
Pour pt, °F.: +90
Sulfur, wt %: 0.39
Rams. carbon res., wt %: 0.15
V/Ni, ppm: 0.1/0.2
Nitrogen, wt %: 0.086

Residue
Range, °F.: 650+
Yield, vol %: 42.9
Vis., SUS @ 210° F.: 125.43
Pour pt, °F.: +80
Total sulfur, wt %: 0.565
Rams. carbon res., wt %: 3.69
Nitrogen, wt %: 0.225
V/Ni, ppm: 3.8/12.6

Forcados Blend, Nigeria

CALMS some 7 miles off coast

Crude
Gravity, °API: 29.7
Sulfur, wt %: 0.29
Pour pt, °C.: −20
Kin. vis., cSt @ 10° C.: 10.6
C_4 & lighter: 0.7

Light naphtha
Range, °C.: C_5—65
Yield, wt %: 1.4
Density @ 15° C., g/cu cm: 0.650
RON + 0.4 g Pb/l: 87.5

Heavy naphtha
Range, °C.: 65—175
Yield, wt %: 12.3
Density @ 15° C., g/cu cm: 0.765
RON + 0.4 g Pb/l: 75
Aromatics, vol %: 12.0
Naphthenes, vol %: 53

Kerosine
Range, °C.: 175—225
Yield, wt %: 9.0
Density @ 15° C., g/cu cm: 0.830
Sulfur, wt %: 0.04

Gas oil
Range, °C.: 225—360
Yield, wt %: 37.8
Density @ 15° C., g/cu cm: 0.880
Sulfur, wt %: 0.18
Pour pt, °C.: −17
Cold filter pour pt, °C.: −15
Kin. vis., cSt @ 100° C.: 1.46

Heavy gas oil
Range, °C.: 360—525
Yield, wt %: 28.6
Density @ 15° C.: 0.941
Sulfur, wt %: 0.40
Kin. vis., cSt @ 100° C.: 10.6

Residue
Range, °C.: 360+
Yield, wt %: 38.8
Density @ 15° C.: 0.953
Sulfur, wt %: 0.56
Kin. vis., cSt @ 100° C.: 22.1

Gamba, Gabon

Buoy 6 km offshore from Gamba tank farm

Crude
Gravity, °API: 31.8
Vis., cSt @ 37.8° C.: 36.7
Pour pt, °C.: +23
Total sulfur, wt %: 0.11
Con. carbon, wt %: 3.10
UOP charac. factor: 12.20
Yield C_1—C_5, vol %: 1.42

Gasoline
Range, °C.: C_5—80
Yield, vol %: 1.3
Rvp, psi, g/sq cm: 800
RON, clear: 90
Sulfur, wt %: 0.0036

Heavy naphtha
Range, °C.: 80—160
Yield, vol %: 4.9
Density @ 15/4 °C.: 0.753
Paraffins, vol %: 46.9
Naphthenes, vol %: 50.6
Aromatics, vol %: 2.5
Sulfur, wt %: 0.0069

Kerosine
Range, °C.: 160—250
Yield, vol %: 11.8
Density @ 15/4 °C.: 0.808
Freezing pt, °C.: −52
Smoke pt, mm: 23
Sulfur, wt %: 0.014
Aniline pt, °C.: 64.2
Aromatics, vol %: 14.0

Gas oil
Range, °C.: 250—350
Yield, vol %: 19.3
Density @ 15/4 °C.: 0.838
Pour pt, °C.: −14
Cloud pt, °C.: −11
Vis., °Engler @ 20° C.: 1.58
Cetane index: 53
Sulfur, wt %: 0.057
Diesel index: 66
Aniline pt, °C.: 80.4

Residue
Range, °C.: +350
Yield, vol %: 62.0
Density @ 15/4 °C.: 0.900
Pour pt., °C.: +45
Vis., °Engler @ 50° C.: 18.9
Sulfur, wt %: 0.16

Kole Marine Blend, Cameroon

CALM with floating storage in offshore producing area

Crude
Gravity, °API: 34.89
Vis., cSt @ 10° C.: 11.1
Pour pt, °C.: −6
Total sulfur, wt %: 0.30
Rvp @ 37.8° C., g/sq cm: 445
Paraffins, wt %: 6.2
Con. carbon, wt %: 3.65
UOP charac. factor: 11.9
V/Ni, kg/mg: 9/27
C_1—C_5, yield, vol %: 6.12

Light gasoline
Range, °C.: 15—80
Yield, vol %: 5.71
RON, clear: 76.2

Heavy naphtha
Range, °C.: 80—180
Yield, vol %: 21.89
Density, 15/4 °C.: 0.765
Paraffins, vol %: 38.5
Naphthenes, vol %: 53.3
Aromatics, vol %: 8.2
Sulfur, wt %: 0.0080

Kerosine
Range, °C.: 180—225
Yield, vol %: 8.21
Density @ 15/4 °C.: 0.819
Freeze pt, °C.: −63
Smoke pt, mm: 20
Sulfur, wt %: 0.0467
Aromatics, vol %: 13.4

Gas oil
Range, °C.: 150—400
Yield, vol %: 43.89
Density @ 15/4 °C.: 0.839
Pour pt, °C.: −9
Vis., cSt @ 50° C.: 2.6
Cetane index: 52.0
Sulfur, wt %: 0.16

Gas oil
Range, °C.: 180—350
Yield, vol %: 30.46
Density @ 15/4 °C.: 0.838
Pour pt, °C.: −22
Sulfur, wt %: 0.15

Residue
Range, °C.: 350+
Yield, vol %: 38.91
Density @ 15/4 °C.: 0.947
V/Ni, ppm: 20/68
Pour pt, °C.: +33
Vis. @ 50° C.: 425
Ash, wt %: 0.05
Sulfur, wt %: 0.54

Lucina Marine, Gabon

CALM with floating storage in offshore producing area

Crude
Gravity, °API: 39.52
Vis., cSt @ 20° C.: 16.00
Pour pt, °C.: +15
Rvp @ 37.8° C., g/sq cm: 450
Total sulfur, wt %: 0.05
Asphaltenes, wt %: 0.06
UOP charac. factor: 12.25
V/Ni, kg/mg: 1.3/12.2

Gasoline
Range, °C.: C_5—80
Yield, vol %: 5.56
Rvp, g/sq cm: 698
RON, clear: 66.3

Heavy gasoline
Range, °C.: 80—150
Yield, vol %: 13.46
Paraffins, vol %: 54.3
Naphthenes, vol %: 37.8
Aromatics, vol %: 7.9
Sulfur, wt %: 0.005

Kerosine
Range, °C.: 150—225
Yield, vol %: 14.38
Density @ 15/4 °C.: 0.778
Freeze pt, °C.: −[illegible]
Vis., cSt @ 34 [illegible]° C.: 5.07
Smoke pt, mm: 21
Sulfur, wt %: 0.006
Aromatics, vol %: 10.6

Gas oil
Range, °C.: 150—350
Yield, vol %: 38.59
Density @ 15/4 °C.: 0.809
Pour pt, °C.: −18
Vis., °Engler @ 50° C.: 1.78
Cetane index: 60.0
Diesel index: 71.8
Sulfur, wt %; 0.010
Aniline pt, °C.: 74.2

Residue
Range, °C.: 350+
Yield, vol %: 40.23
Density @ 15/4 °C.: 0.898
Pour pt, °C.: +36
Vis., cSt @ 50° C.: 86.4
Sulfur, wt %: 0.060
Asphaltenes, wt %: 0.08
Con. carbon, wt %: 2.96
V, ppm: 3

Mandji, Gabon

Cap Lopez terminal, loading berth, Prince's Bay

Crude
Gravity, °API: 30.5
Vis., cSt @ 10° C.,: 44.0
Pour pt, °C.: +3
Rvp @ 37.8° C., g/sq cm: 270
Total sulfur, wt %: 1.10
Asphaltenes, wt %: 0.3
Con. carbon, wt %: 5.40
UOP charac. factor: 12.1
V/Ni, kg/mg: 48/50
C_1—C_5, yield, vol %: 4.46

Gasoline
Range, °C.: 15—80
Yield, vol %: 5.38
RON, clear: 74.2

Heavy naphtha
Range, °C.: 80—150
Yield, vol %: 9.63
Paraffins, vol %: 55.2
Naphthenes, vol %: 36.7
Aromatics, vol %: 8.1
Sulfur, wt %: 0.006

Kerosine
Range, °C.: 150—225
Yield, vol %: 10.37
Density @ 15/4 °C.: 0.795
Freeze pt, °C.: −53
Smoke pt, mm: 24
Sulfur, wt %: 0.101
Aromatics, vol %: 17.3
Aniline pt, °C.: 56.1

Gas oil
Range, °C.: 150—375
Yield, vol %: 36.12
Density @ 15/4 °C.: 0.839
Pour pt, °C.: −15
Vis., cSt @ 50° C.: 2.28
Cetane index: 55.1
Diesel index: 59.7
Sulfur, wt %: 0.4
Aniline pt, °C.: 69.3

Heavy gas oil
Range, °C.: 375—525
Yield, vol %: 23.10
Density @ 15/4 °C.: 0.909
Pour pt, °C.: +37
Vis., cSt @ 50° C.: 50
Nitrogen, ppm: 480
Aniline pt, °C.: 85.4
Ni, ppm: <1
Sulfur, wt %: 1.14
Con. carbon, wt %: 0.45

Residue
Range, °C.: 375+
Yield, vol %: 46.96
Density @ 15/4 °C.: 0.952
V/Ni, ppm: 93/98
Pour pt, °C.: +36
Vis., cSt @ 50° C.: 2,100
Sulfur, wt %: 1.81
Asphaltenes, wt %: 0.49
Con. carbon, wt %: 10.2

Pennington, Nigeria

CALM with export from floating storage in offshore producing area

Crude
Gravity, °API: 36.6
Sulfur, wt %: 0.07

Vis., cSt @ 104° F.: 3.06
Pour pt, °F.: 43
C_4 & lighter, vol %: 1.5
Rvp @ 100° F., psi: 5.1
Con. carbon residue, wt %: 0.7
V/Ni, ppm: 2/1

Light naphtha
Range, °F.: C_5—200
Yield, vol %: 7.4
Sulfur, wt %: 0.001
Paraffins, vol %: 70.5
Naphthenes, vol %: 25.5
Aromatics, vol %: 3.5
RON, clear: 74.9

Heavy naphtha
Range, °F.: 200—340
Yield, vol %: 14.7
Sulfur, wt %: 0.001
P/N/A, vol %: 35.0/52.5/12.0
RON, clear: 55.5
Aniline pt, °F.: 118

Kerosine
Range, °F.: 340—470
Yield, vol %: 18.0
Gravity, °API: 40.6
Sulfur, wt %: 0.02
Vis., cSt @ 104° F.: 1.45
Smoke pt, mm: 19.5
Freeze pt, °F.: −69
Aniline pt, °F.: 135
Cloud pt, °F. < −76

Gas oil
Range, °F.: 470—650
Yield, vol %: 31.7
Gravity, °API: 33.7
Sulfur, wt %: 0.05
Vis., cSt @ 104° F.: 3.72
Pour pt, °F. −1.0
Aniline pt, °F.: 158
Cloud pt, °F.: 6.0

Vacuum gas oil
Range, °F.: 650—1,000
Yield, vol %: 23.4
Gravity, °API: 23.5
Sulfur, wt %: 0.15
Vis., cSt @ 122° F.: 28.9
Pour pt, °F.: 102
Aniline pt, °F.: 184
Con. carbon residue, wt %: 0.12
V/Ni, ppm: 2/<1

Residue
Range, °F.: 650+
Yield, vol %: 26.7
Gravity, °API: 21.8
Sulfur, wt %: 0.17
Vis., cSt @ 122° F.: 48.5
Pour pt, °F.: 91
Aniline pt, °F.: 179
Con. carbon residue, wt %: 2.3

Qua Iboe, Nigeria

CALM in offshore producing area

Crude
Gravity, °API: 35.8
Pour pt, °F.: 45
Kin. vis., cSt @ 59° F.: 6.76
@ 104° F.: 3.39
Con. carbon residue, wt %: 0.92
Aniline pt, °C.: 62.56
Sulfur, wt %: 0.12
Rvp, psi: 6.0
Nitrogen, total, ppm: 540
V/Ni, ppm: 0.3/3.3
C_5 & lighter, yield, vol %: 5.13

Light naphtha
Range (TBP), °F.: 60—180
Yield, vol %: 5.15
Rvp, psi: 10.3
Paraffins, vol %: 67.3
Naphthenes, vol %: 31.6
Aromatics, vol %: 1.1
Sulfur, wt %: 0.0008

Heavy naphtha
Range, °F.: 180—380
Yield, vol %: 25.14
Rvp, psi: 1.0
P/N/A, vol %: 34.6/55.3/10.1
RON, clear: 56.6
RON + 3 ml TEL/gal: 76.0
Sulfur, wt %: 0.026

Kerosine
Range, °F.: 330—444
Yield, vol %: 13.64
Gravity, °API: 41.2
P/N/A, vol %: 36.4/49.3/14.3
Freezing pt, °F.: −50
Smoke pt, mm: 20
Aniline pt, °F.: 132.1
Diesel index: 54
Cetane index: 39
Sulfur, wt %: 0.05

Light gas oil
Range, °F.: 380—710
Yield, vol %: 42.63
Gravity, °API: 33.1
Pour pt, °F: 15
Aniline pt, °F.: 151.4
Sulfur, wt %: 0.11

Heavy gas oil
Range, °F.: 710—850
Yield, vol %: 12.18
Gravity, °API: 22.7
Pour pt, °F.: 95
Kin. vis., cSt @ 100° F.: 68.55
Aniline pt, °F.: 178.7
Diesel index: 41
Sulfur, wt %: 0.16
Nitrogen, total, ppm: 679
Con. carbon, wt %: 0.02

Residue
Range, °F.: 710+
Yield, vol %: 24.65
Gravity, °F.: 17.9
Pour pt, °F.: 110
Kin. vis., cSt @ 100° F.: 900.93
Sulfur, wt %: 0.23
Nitrogen, total, ppm: 1,604
Con. carbon residue, wt %: 3.36
V/Ni, ppm: 1.2/13.1

Salt Pond, Ghana

SALM with hawser-moored permanent storage in offshore producing area

Crude
Gravity, °API: 37.4
Sulfur, wt %: 0.097
C_1—C_3 yield, vol %: 0.37

Gasoline
Range, °F.: 115—180
Yield, vol %: 9.23
RON, clear: 57.0

Gasoline
Range, °F.: 180—220
Yield, vol %: 2.90
RON, clear: 51.0

Naphtha
Range, °F.: 220—250
Yield, vol %: 2.50
RON, clear: 46.5

Naphtha
Range, °F.: 250—320
Yield, vol %: 7.20

Heavy naphtha
Range, °F.: 320—360
Yield, vol %: 4.30
Aniline pt, °F.: 138

Kerosine
Range, °F.: 360—500
Yield, vol %: 16.30
Gravity, °API: 43.7
Pour pt, °F.: −36
Sulfur, wt %: 0.020
Aniline pt, °F.: 148

Gas oil
Range, °F.: 500—600
Yield, vol %: 10.90
Gravity, °API: 37.3
Pour pt, °F.: 11
Sulfur, wt %: 0.030
Aniline pt, °F.: 163

Gas oil
Range, °F.: 600—650
Yield, vol %: 5.10
Gravity, °API: 34.4
Pour pt, °F.: 38
Sulfur, wt %: 0.070
Aniline pt, °F.: 173

Heavy gas oil
Range, °F.: 650—940
Yield, vol %: 21.20
Gravity, °API: 27.9
Sulfur, wt %: 0.110
Nitrogen, %: 0.0300

Vacuum bottoms
Range, °F.: 940+
Yield, vol %: 20.00
Gravity, °API: 17.6
Sulfur, wt %: 0.250
K factor: 11.89
Vis., Sfs @ 210° F.: 263.0

Soyo Blend, Angola

Quinfequena terminal

Crude
Gravity, °API: 33.7
Sulfur, wt %: 0.23
Pour pt, °C.: +18
Vis., cSt @ 37.8° C.: 10.08
Asphaltenes, wt %: 0.72
Total acidity, mg KOH/g: 0.07
Wax content, wt % @ −30° C.: 14.7
V/Ni, ppm: 5/15
C_1—C_5 (GLC), yield, wt %: 2.33

Gasoline
Range (TBP), °C.: C_5—80
Yield, vol %: 3.86
RON + 0.4 g TEL/l: 83.7

Heavy naphtha
Range, °C.: 80—150
Yield, vol %: 9.63
Density @ 15° C.: 0.745
Naphthenes, vol %: 37.2
Aromatics, vol %: 10

Kerosine
Range, °C.: 150—230
Density @ 15° C.: 0.793
Sulfur, wt %: 0.021
Freeze pt, °C.: −53
Aromatics, vol %: 16
Smoke pt, mm: 25
Naphthenic acids, ppm: 58

Gas oil
Range, °C.: 230—340
Yield, vol %: 19.99
Density @ 15° C.: 0.838

Sulfur, wt %: 0.12
Cloud pt, °C.: −8
Cetane index: 53.0
Vis., cSt @ 50° C.: 2.73

Heavy gas oil
Range, °C.: 340—510
Yield, vol %: 26.22
Density @ 15° C.: 0.8824
Sulfur, wt %: 0.24
Aniline pt, °C.: 94.0
Basic nitrogen, ppm: 298
Total nitrogen, wt %: 0.10
Con. carbon, wt %: 0.01
V/Ni, ppm: <2/<2

Residue
Range, °C.: 340+
Yield, vol %: 52.16
Density @ 15° C.: 0.920
Sulfur, wt %: 0.21
Vis., cSt @ 50° C.: 160.8
Con. carbon, wt %: 5.5

Zaire, Zaire

CALM with moored storage in offshore producing area

Crude
Gravity, °API: 31.7
Sulfur, wt %: 0.13
Vis., SUS @ 100° F.: 98.0
Pour pt, °F.: +80
C_4 & lighter, vol %: 1.00
Rvp, lb: 2.2
V/Ni, ppm: 1.5/17.8
Salt, lb/1 000 bbl: 6
ASTM, 50% pt, °F.: >590

Light naphtha
Range (TBP), °F.: Ibp—140*
Yield, vol %: 1.84
Sulfur, wt %: 0.037
RON, clear: 79.4

Light naphtha
Range, °F.: 140—170
Yield, vol %: 1.03
Sulfur, wt %: 0.020
Paraffins, vol %: 76.5
Naphthenes, vol %: 22.2
Aromatics, vol %: 1.3
RON, clear: 65.7

Heavy naphtha
Range, °F.: 170—310
Yield, vol %: 8.84
Sulfur, wt %: 0.006
P/N/A, vol %: 53.8/41.6/4.6
Aniline pt, °F.: 133.5

Kerosine
Range, °F.: 310—520
Yield, vol %: 16.31
Sulfur, wt %: 0.074
Freezing pt, °F.: −36
Aniline pt, °F.: 147.2
Cetane index: 50.0
Smoke pt, mm: 27

Light gas oil
Range, °F.: 520—680
Yield, vol %: 15.44
Vis., SUS @ 100° F.: 45.0
Sulfur, wt %: 0.14
Pour pt, °F.: +45
Diesel index: 62.4
Cetane index: 62.0

Heavy gas oil
Range (TBP to EFV), °F.: 680—1,000
Yield, vol %: 31.39
Gravity, °API: 26.7
Vis., SUS @ 210° F.: 54.0
Sulfur, wt %: 0.12
Total nitrogen, ppm: 1,010
Pour pt, °F.: +115
Aniline pt, °F.: 214.3
V/Ni, ppm: 0.1/0.3

Residual oil
Range, °F.: 680+
Yield, vol %: 55.65
Gravity, °API: 21.4
Vis., SUS @ 210° F.: 181.9
Sulfur, wt %: 0.17
Con. carbon res., wt %: 6.03
Pour pt, °F.: +100
V/Ni, ppm: 2.5/30
*Does not include C_4 and lighter

North Africa

Amna (high pour), Libya

Ras Lanuf/CBMs & SPM

Crude
Gravity, °API: 36.1
Sulfur, wt %: 0.15
Pour pt, °F.: 75
Kin. vis., cSt @ 37.8° C.: 13.70
Car. residue (CCR), wt %: 3.7
Rvp, psi: 3.9
Salt, lb/1,000 bbl: 8.2
V/Ni, ppm: 0.6/5.0
Ibp-60° F., yield, vol %: 2.11

Light naphtha
Range, °F.: 60-120
Yield, vol %: 2.4
Gravity, °API: 93.6
Sulfur, wt %: 0.01
Paraffins, vol %: 99.0
Naphthenes, vol %: 1.0
RON, clear: 78.0
RON + 3 ml TEL: 94.0

Light naphtha
Range, °F.: 120-250
Yield, vol %: 7.7
Gravity, °API: 69.5
Sulfur, wt %: 0.01
Paraffins, vol %: 69.9
Naphthenes, vol %: 26.5
Aromatics, vol %: 3.7

Heavy naphtha
Range, °F.: 250-330
Yield, vol %: 6.9
Gravity, °API: 57.4
Sulfur, wt %: 0.02
P/N/A, vol %: 60.5/33.6/5.9

Kerosine
Range, °F.: 330-443
Yield, vol %: 9.4
Gravity, °API: 49.9
Sulfur, wt %: 0.05
P/N/A, vol %: 60.9/29.9/9.2
Pour pt, °F.: −75
Freezing pt, °F.: −58
Aniline pt, °F.: 150.6
Diesel index: 75
Smoke pt, mm: 31

Gas oil
Range, °F.: 443-600
Yield, vol %: 15.0
Gravity, °API: 42.3
Sulfur, wt %: 0.07
Pour pt, °F.: 0
Aniline pt, °F.: 169.1
Diesel index: 71

Gas oil
Range, °F.: 600-850
Yield, vol %: 23.3
Sulfur, wt %: 0.13
Pour pt, °F.: 80
Aniline pt, °F.: 202.0
Diesel index: 69

Residual oil
Range, °F.: 655+
Yield, vol %: 55.4
Gravity, °API: 25.4
Sulfur, wt %: 0.22
Pour pt, °F.: 100
Car. residue CCR, wt %: 6.22
V/Ni, ppm: 1.1/8.5

Residual oil
Range, °F.: 1,000+
Yield, vol %: 21.8
Gravity, °API: 16.7
Sulfur, wt %: 0.31
Pour pt, °F.: 130
Car. residue CCR, wt %: 14.50
V/Ni, ppm: 2.5/20.0

Ashtart, Tunisia

Floating storage barge in Gulf of Gabes producing area

Crude
Gravity, °API: 29.03
Vis. @ 20° C., cSt: 24.0
Pour pt, °C.: +9
Rvp @ 38.7° C., g/sq cm: 130
Total sulfur, wt %: 1.0
Paraffins/Asphaltenes, wt %: 11.0/1.8
Con. carbon, wt %: 5.4
$>C_1$-C_5, vol %: 1.26
V/Ni, mg/kg: 20/9

Light naphtha
Range (TBP), °C.: 15-100
Yield, vol %: 5.65
Density, 15/4 °C.: 0.702
Rvp, g/sq cm: 500
RON, clear: 63.6
Aromatics, vol %: 10.0

Heavy naphtha
Range (TBP), °C.: 100-145
Yield, vol %: 6.42
Density, 15/4 °C.: 0.759
Paraffins, vol %: 47.2
Naphthenes, vol %: 37.8
Aromatics, vol %: 15.0
Sulfur, wt %: 0.0055

Heavy naphtha
Range (TBP), °C.: 145-180
Yield, vol %: 5.91
Density, 15/4 °C.: 0.785
P/N/A, vol %: 46.5/33.8/19.7
Sulfur, wt %: 0.0120

Kerosine
Range (TBP), °C.: 180-225
Yield, vol %: 6.65
Density, 15/4 °C.: 0.812
Freeze pt, °C.: −54
Vis., cSt @ 50° C.: 1.10
Smoke pt, mm: 21
Sulfur, wt %: 0.04
Aniline pt, °C.: 54.0
Aromatics, vol %: 18.9

Gas oil
Range (TBP), °C.: 145-350
Yield, vol %: 36.04
Density, 15/4 °C.: 0.834
Pour pt, °C.: −21
Cloud pt, °C.: −16
Filterability, °C.: −19
Vis. cSt @ 50° C.: 1.9
Cetane index: 48.8
Sulfur, wt %: 0.44
Diesel index: 54.7
Aniline pt, °C.: 62.0
Con. carbon @ 10%, wt %: <0.05

Residue
Range (TBP), °C.: 350+
Yield, vol %: 51.90
Density, 15/4 °C.: 0.943
Pour pt, °C.: +18
Vis. cSt, @ 50° C.: 225
Sulfur, wt %: 1.42
Con. carbon, wt %: 9.4
V/Ni, ppm: 34/17
N, wt %: 0.40

Brega, Libya

Marsa el Brega/ CBM, SPM, SBM

Crude
Gravity, °API: 40.4
Sulfur, wt %: 0.21
Pour pt, °F.: +30
Rvp, psi: 6.4
Kin., cSt @ 70° F.: 5.58
@ 100° F.: 3.56

Light naphtha
Range, °F.: 68-212
Yield, vol %: 12.4
Gravity, °API: 73.8
Sulfur, wt %: 0.014
Rvp, psi: 7.4
Paraffins, vol %: 72.5
Naphthenes, vol %: 25.3
Aromatics, vol %: 2.2
RON, clear: 65.1

Heavy naphtha
Range, °F.: 212-302
Yield, vol %: 10.7
Gravity, °API: 56.8
Sulfur, wt %: 0.020
P/N/A, vol %: 53.1/39.4/7.5

Kerosine
Range, °F.: 302-455
Yield, vol %: 17.4
Gravity, °API: 46.7
Sulfur, wt %: 0.035
P/N/A, vol %: 51.2/34.7/14.1
Freeze pt, °F.: −70
Smoke pt, mm: 27
Luminometer no.: 61
Aniline pt, °F.: 144
Kin. vis., cSt @ 30° F.: 5.50
@ 100° F.: 1.17

Light gas oil
Range, °F.: 455-650
Yield, vol %: 20.3
Gravity, °API: 38.1
Sulfur, wt %: 0.10
Pour pt, °F.: +15
Aniline pt, °F.: 172
Kin. vis., cSt @ 100° F.: 3.61

Heavy gas oil
Range, °F.: 650-1,049
Yield, vol %: 27.8
Gravity, °API: 27.7
Sulfur, wt %: 0.30
Pour pt, °F.: 105
Aniline pt, °F.: 206
Kin. vis., cSt @ 150° F.: 14.9

Residual oil
Range, °F.: 650+
Yield, vol %: 36.8
Gravity, °API: 23.6
Sulfur, wt %: 0.41
Pour pt, °F.: 95
Con. carbon wt %: 4.1
Kin. vis., cSt @ 100° F.: 184
@ 122° F.: 92.0

Residual oil
Range, °F.: 1,049+
Yield, vol %: 9.0
Gravity, °API: 12.3
Sulfur, wt %: 0.69
Pour pt, °F.: >120
Con. carbon, wt %: 14.6
Kin. vis., cSt @ 210° F.: 620
V/Ni/Fe, ppm: 24/32/124

Bu Attifel, Libya

Zueitina/CBM & SBM

Crude
Gravity, °API: 43.6
Rvp, psi: 0
Sulfur, wt %: 0.034
Pour pt, °F.: +90

Light ends
Range vapor temp., °F.: Ibp-160
Yield, vol %: 2.5

Light naphtha
Range, vapor temp., °F.: 160-290
Yield, vol %: 9.0
Gravity, °API: 62.5
Paraffins, vol %: 75.4
Olefins, vol %: 0.4
Naphthenes, vol %: 18.3
Aromatics, vol %: 5.9

Heavy naphtha
Range, VT, °F.: 290-390
Yield, vol %: 9.0
Gravity, °API: 56.8
Sulfur, wt %: 0.0015
P/O/N/A, vol %: 75.7/0.4/17.8/6.1

Kerosine
Range, VT, °F.: 390-500
Yield, vol %: 11.7
Gravity, °API: 50.3
Sulfur, wt %: 0.005
Aromatics, vol %: 5.6
Smoke pt, mm: 22
Freeze pt, °F.: 9.4
Pour pt, °F.: −10

Diesel
Range, VT, °F.: 500-635
Yield, vol %: 11.3
Gravity, °API: 44.0
Sulfur, wt %: 0.0140
Vis., SSU @ 100° F.: 38.4
Aniline pt, °F.: 192.5
Diesel index: 84.7
Pour pt, °F.: 45

Lt. gas oil
Range, VT, °F.: 635-775
Yield, vol %: 20.7
Gravity, °API: 41.6
Sulfur, wt %: 0.03
Vis., SSU @ 100° F.: 49.5
Pour pt, °F.: +85
UOP "K" factor: 12.6

Heavy gas oil
Range, VT, °F.: 775-932
Yield, vol %: 20.6
Gravity, °API: 37.4
Sulfur, wt %: 0.04
Vis., SSF @ 210° F.: 41.6
Pour pt, °F.: +125
UOP "K" factor: 12.8

Residue
Range, °F.: 932+
Yield, vol %: 15.2
Gravity, °API: 29.2
Sulfur, wt %: 0.10
Carbon residue, wt %: 1.5

El Borma, Tunisia

La Skhirra, Tunisia

Crude
See Algerian Zarzaitine assay. One blend has two names.

Es Sider, Libya

Es Sider/3 CBMs, 1 SBM

Crude
Gravity, °API: 36.7
Kin. vis., cSt @ 100° F.: 5.26
Con. carbon residue, wt %: 1.8
Sulfur, wt %: 0.37
V/Ni, ppm: 1.5/5.6
Pour pt, °C.: +7.2
Rvp, psi: 6.3
C_4 & lighter, vol %: 2.3

Naphtha
Range (TBP), °F.: 82-342
Yield, vol %: 22.2
Gravity, °API: 64.8
Paraffins, vol %: 57.8
Naphthenes, vol %: 36.5
Sulfur, wt %: 0.03

Kerosine
Range (TBP), °F.: 342-472
Yield, vol %: 11.3
Gravity, °API: 46.3
Sulfur, wt %: 0.13
Aromatics, vol %: 13

Heavy distillate
Range (TBP), °F.: 472-705
Yield, vol %: 28.0
Gravity, °API: 35.7
Sulfur, wt %: 0.31

Gas oil
Range (TBP), °F.: 705-980
Yield, vol %: 20.3
Gravity, °API: 25.5
Sulfur, wt %: 0.48

Residue
Range (TBP), °F.: 980+
Yield, vol %: 15.9
Gravity, °API: 12.3
Sulfur, wt %: 1.16
Kin. vis., cSt @ 210° F.: 500
Con. carbon residue, wt %: 14.7
V/Ni, ppm: 8/30

Saharan Blend,* Algeria

Arzew (3 CBMs)
Bejaia (4 jetties)
Skikda

Crude
Gravity, °API: 45.5 (43.7)
Rvp, psi: 8.7 (8.1)
Sulfur, wt %: 0.053 (0.090)
Pour pt, °F.: < −20 (< −20)
Vis. SSU @ 70° F.: 37.3 (40.1)

Light ends
Range, vapor temp., °F.: ibp-160
Yield, vol %: 10.4 (9.9)

Light naphtha
Range, vapor temp., °F.: 160-290
Yield, vol %: 18.3 (14.9)
Gravity, °API: 64.0 (63.7)
Paraffins, vol %: 70.8 (70.2)
Olefins, vol %: 0.3 (0.4)
Naphthenes, vol %: 21.8 (23.4)
Aromatics, vol %: 7.1 (6.0)

Heavy naphtha
Range, VT, °F.: 290-390
Yield, vol %: 13.7 (14.5)
Gravity, °API: 53.3 (52.1)
P/O/N/A, vol %: 47.4/0.3/36.4/15.9 (55.0/0.3/29.6/15.1)

Kerosine
Range, VT, °F.: 390-500
Yield, vol %: 14.1 (13.4)
Gravity, °API: 44.6 (44.0)
Sulfur, wt %: 0.0056 (0.0030)
Aromatics, vol %: 15.8 (16.4)
Smoke pt, mm: 17 (21)
Freeze pt, °F.: −38.2 (−42.7)

Diesel
Range, VT, °F.: 500-635
Yield, vol %: 12.7 (12.8)
Gravity, °API: 36.6 (35.1)
Sulfur, wt %: 0.0571 (0.0736)
Vis. SSU @ 100° F.: 41.6 (40.3)
Pour pt, °F.: +15 (+5)
Aniline pt, °F.: 170 (165.5)
Diesel index: 62.2 (58.1)

Light gas oil
Range, VT, °F.: 635-775
Yield, vol %: 9.3 (14.3)
Gravity, °API: 31.1 (31.7)
Sulfur, wt %: 0.07 (0.13)
Vis. SSU @ 100° F.: 57.5 (63.0)
Pour pt, °F.: +50 (+40)

Heavy gas oil
Range, VT, °F.: 775-932
Yield, vol %: 12.0 (10.0)
Gravity, °API: 28.6 (26.5)
Sulfur, wt %: 0.10 (0.18)
Vis., SSU @ 210° F.: 49.6 (54.5)
Pour pt, °F.: +90 (+90)
Carbon residue, wt %: 0.05 (0.06)

Residue
Range, VT, °F.: 932+
Yield, vol %: 9.5 (10.2)
Gravity, °API: 21.2 (19.9)
Sulfur, wt %. 0.22 (0.28)
Vis., SSF, @ 210° F.: 38.0 (45.1)
Carbon residue, wt %: 6.8 (7.4)

*Gravity of Saharan Blend has not been consistent. Values in parenthesis are those for 43.7 °API blend.

Sarir, Libya

Marsa al Hariga (Tobruk)/CBM

Crude
Gravity, °API: 38.3
Sulfur, wt %: 0.18
Pour pt, °F.: 25
Kin. vis. cSt @ 50° C.: 4.73
Yield, C_2-C_4, vol %: 3.82
V/Ni, ppm: 6/14

Naphtha
Range, °C.: Ibp-180
Yield, vol %: 22.89
Total sulfur, ppm: 14
Paraffins, vol %: 60.8
Naphthenes, vol %: 35.8
Aromatics, vol %: 3.4

Kerosine
Range, °C.: 180-250
Yield, vol %: 11.27
Total sulfur, ppm: 83
Smoke pt, mm: 30

Gas oil
Range, °C.: 250-320
Yield, vol %: 10.99
Total sulfur, wt %: 0.063
Pour pt, °C.: −6
Aniline pt, °C.: 80

Resid
Range, °C.: 320+
Yield, vol %: 51.41
Total sulfur, wt %: 0.24
Vis. cSt @ 60° C.: 49
Con. carbon, wt %: 6.8

Resid
Range, °C.: 550+
Yield, vol %: 17.25
Total sulfur, wt %: 0.35
Con. carbon, wt %: 20
Asphaltenes, wt %: 4.7

Sirtica, Libya

Ras Lanuf/CBMs & SBM

Crude
Gravity, °API: 43.3
Total sulfur, wt %: 0.43
Pour pt, °C.: −3
Yield C_2-C_4, wt %: 3.24
Rvp, psi: 10.1

Condensate
Yield, vol %: 42

Naphtha
Range, °C.: Ibp-180
Yield, vol %: 39.7
Gravity, °API: 62.8
Total sulfur, wt %: 0.015
P/N/A, vol %: 69.7/22.8/7.5

Gas oil
Range, °C.: 180-350
Yield, vol %: 29.8
Gravity, °API: 38.7
Total sulfur, wt %: .21
Pour pt, °C.: −15

Resid
Range, °C.: 350+
Yield, vol %: 25.5
Gravity, °API: 19.1
Total sulfur, wt %: 1.16
Vis. cSt @ 180° F.: 39.0
Pour pt, °C.: 39
Con. carbon, wt %: 5.7

Zarzaitine, Algeria

La Skhirra, Tunisia

Crude
Gravity, °API: 43.0
Vis. cSt @ 10° C.: 6.90
Pour pt, °C.: −12
Rvp @ 37.8° C., g/sq cm: 603
Total sulfur, wt %: 0.07
Paraffins, wt %: 4.89
Con. carbon, wt %: 0.90
V/Ni, mg/kg: 1/3
Yield C_1-C_5, vol %: 7.31

Light naphtha
Range, °C.: C_5-80
Yield, vol %: 8.94
Density, 15/4 °C.: 0.662
RON, clear: 68.8
MON, clear: 64.6
Aromatics, vol %: 0.9

Heavy naphtha
Range, °C.: 80-145
Yield, vol %: 15.13
Density, 15/4 °C.: 0.738
Paraffins, vol %: 59.4
Naphthenes, vol %: 33.9
Aromatics, vol %: 6.7
Sulfur, wt %: 0.0138

Kerosine
Range, °C.: 145-225
Yield, vol %: 16.58
Density, 15/4 °C.: 0.784
Freeze pt, °C.: −65
Vis. cSt @ 34.4° C.: 4.50
Smoke pt, mm: 25
Sulfur, wt %: 0.0162
Aromatics, vol %: 14.2

Gas oil
Range, °C.: 225-290
Yield, vol %: 12.55
Density, 15/4 °C.: 0.822
Pour pt, °C.: −36
Cloud pt, °C.: −27
Filterability, °C.: −34
Vis. cSt @ 50° C.: 1.95
Sulfur, wt %: 0.025

Gas oil
Range, °C.: 290-350
Yield, vol %: 10.89
Density, 15/4 °C.: 0.843
Pour pt, °C.: −3
Vis. cSt @ 50° C.: 4.18
Sulfur, wt%: 0.045

Residue
Range, °C.: 350+
Yield, vol %: 32.47
Pour pt, °C.: +21
Density, 15/4 °C.: 0.899
Vis., cSt @ 50° C.: 80
Sulfur, wt %: 0.155
Asphaltenes, wt %: 0.21
Con. carbon, wt %: 2.48
V, ppm: 2.5

Zueitina, Libya

Zueitina/CBMs & SBM

Crude
Gravity, °API: 41.3
Rvp, psi: 4.6
Sulfur, wt %: 0.28
Pour pt, °F.: 45
Vis. SSU @ 60° F.: 199.1

Light ends
Range, °F.: Ibp–113
Yield, vol %: 6.44

Light naphtha
Range, °F.: 113-220
Yield, vol %: 9.32
Gravity, °API: 66.9
Paraffins, vol %: 65.5
Naphthenes, vol %: 30.9
Aromatics, vol %: 3.6

Naphtha
Range, °F.: 220-390
Yield, vol %: 21.42
Gravity, °API: 53.9
Sulfur, wt %: 0.04
P/N/A, vol %: 59.2/27.0/10.2

Kerosine
Range, °F.: 315-500
Yield, vol %: 21.65

Gravity, °API: 45.6
Total sulfur, wt %: 0.11
Aromatics, vol %: 14.0
Smoke pt, mm: 27
Freeze pt, °F.: −36
Pour pt, °F.: −45

Light distillate
Range, °F.: 390-550
Yield, vol %: 18.16
Gravity, °API: 41.7
Cetane index: 53.0
Total sulfur, wt %: 0.17
Aniline pt, °F.: 159.0
Pour pt, °F.: −10

Light gas oil
Range, °F.: 450-650
Yield, vol %: 21.17
Gravity, °API: 38.4
Cetane index: 57.8
Total sulfur, wt %: 0.24
Total nitrogen, ppm: 78
Aniline pt, °F.: 173.0
Pour pt, °F.: 25

Heavy gas oil
Range, °F.: 650-1,000
Yield, vol %: 24.09
Gravity, °API: 29.1
Sulfur, wt %: 0.36
Total nitrogen, ppm: 922
Pour pt, °F.: 100
Carbon residue, wt %: 0.18

Vacuum flashed resid
Range, °F.: 1,000+
Yield, vol %: 10.11
Gravity, °API: 13.5
Total sulfur, wt %: 0.90

Asia

Ardjuna, Indonesia

SBM 18.5 miles off north coast of Java in producing area

Crude
Gravity, °API: 35.2
Sulfur, wt %: 0.105
Pour pt, °F.: 75
Rvp, lb: 5.3
Kin. vis. @ 100° F.: 3.738
Carbon residue, wt %: 1.38
V/Ni, ppm: <1/3
Nitrogen, ppm: 280
Yield, C_4 & lighter, vol %: 2.6

Naphtha
Range (TBP), °F.: C_5—150
Yield, vol %: 5.0
Sulfur, wt %: 0.005
RON, clear: 76.6
RON + 0.5 g TEL/gal: 82.7
MON, clear: 74.8

Heavy naphtha
Range, °F.: 150-380
Yield, vol %: 27.2
Gravity, °API: 50.8
Sulfur, wt %: 0.012
Paraffins, vol %: 34.3
Naphthenes, vol %: 46.0
Aromatics, vol %: 19.7
RON, clear: 64.6
MON, clear: 63.0

Distillate
Range, °F.: 380-520
Yield, vol %: 16.4
Gravity, °API: 33.0
Sulfur, wt %: 0.059
Pour pt, °F.: −65
Cetane no.: 36.3
Smoke pt, °F.: 12.5
Freezing pt, °F.: −39.5
Aromatics, vol %: 34.6
Total N, ppm: 4.0
Cloud pt, °F.: −46
Vis., cSt @ 100° F.: 1.967

Distillate
Range, °F.: 520-650
Yield, vol %: 14.0
Gravity, °API: 30.7
Sulfur, wt %: 0.099
Pour pt, °F.: −65
Cetane no.: 47.0
Total N, ppm: 33.0
Cloud pt, °F.: −26
Vis., cSt @ 100° F.: 4.689

Blended gas oil
Range, °F.: 650-840
Yield, vol %: 16.9
Gravity, °API: 25.1
Sulfur, wt %: 0.156
Aniline pt, °C.: 86.7
Pour pt, °F.: 90
Kin. vis. @ 210° F.: 3.983
Carbon residue, wt %: 0.02
Total nitrogen, ppm: 200

Residue
Range, °F.: 650+
Yield, vol %: 34.8
Gravity, °API: 21.1
Sulfur, wt %: 0.199
Carbon residue, %: 2.94
Total nitrogen, ppm: 670
Pour pt, °F.: 100
Kin. vis. @ 210° F.: 5.414

Vacuum residue
Range: Bottoms from vacuum flashed 650+ °F. resid @ 725° F.
Yield, vol %: 5.9
Gravity, °API: 5.1
Sulfur, wt %: 0.292
Carbon residue, wt %: 17.86
V/Ni, ppm: 7/30

Arimbi, Indonesia

Balongan sea terminal/SBM about 6.5 nautical miles off north coast of Java

Crude
Gravity, °API: 31.8
Sulfur, wt %: 0.204
Pour pt, °F.: 100
Vis., cSt @ 100° F.: 12.54
Carbon residue, wt %: 2.41
V/Ni, ppm: 0.9/2.6
Nitrogen, ppm: 531

Naphtha
Range (TBP), °F.: C_5—230
Yield, vol %: 10.6
Sulfur, wt %: <0.001
RON, clear: 64.6
RON + 0.5 g TEL/gal: 71.7

Naphtha
Range, °F.: 230-335
Yield, vol %: 11.2
Sulfur, wt %: 0.030
Total nitrogen, ppm: 1
Paraffins, vol %: 42.3
Naphthenes, vol %: 47.0
Aromatics, vol %: 10.7

Distillate
Range, °F.: 335-520
Yield, vol %: 17.3
Gravity, °API: 34.6
Sulfur, wt %: 0.107
Cetane no.: 37.3
Smoke pt, °F.: 14
Freezing pt, °F.: −32
Aromatics, vol %: 35.3

Distillate
Range, °F.: 520-650
Yield, vol %: 14.7
Gravity, °API: 31.6
Sulfur, wt %: 0.213
Pour pt, °F.: 45
Cetane no.: 50.2
Cloud pt, °F.: 50
Vis., cSt @ 100° F.: 5.450

Blended gas oil
Range, °F.: 650-840
Yield, vol %: 15.9
Gravity, °API: 29.0
Sulfur, wt %: 0.168
Aniline pt, °C.: 93.4
Pour pt, °F.: 110
Vis., cSt @ 210° F.: 4.385
Carbon residue, %: 0.008
Nitrogen, ppm: 266

Residue
Range, °F.: 650+
Yield, vol %: 45.9
Gravity, °API: 20.5
Sulfur, wt %: 0.240
Carbon residue, %: 5.27
Total nitrogen, ppm: 1,010
Pour pt, °F.: 120+
Vis. @ 210° F. (D2170): 22.29
V/Ni, ppm: 2.7/9.8

Attaka, Indonesia

Santan marine terminal about 80 miles north of Balikpapan, Kalimantan/SBM about 4 miles offshore

Crude
Gravity, °API: 42.3
Vis., cSt @ 70° F.: 1.7
Pour pt, °F.: −10
Rvp @ 100° F., psi: 6.8
Total acid no., Mg KOH/g: 0.20
Sulfur, wt %: 0.09
Wax, wt %: 4.22
Con. carbon residue, wt %: 0.34
Charac. factor, K UOP: 11.5

Naphtha
Range, °C.: C_5—100
Yield, vol %: 15.3
RON, clear: 74.9

Naphtha
Range, °C.: 100-150
Yield, vol %: 17.6
Paraffins, vol %: 41
Naphthenes, vol %: 35
Aromatics, vol %: 24.7

Kerosine
Range, °C.: 150-250
Yield, vol %: 29.6
Smoke pt, mm: 16
Freezing pt, °C.: −54

Gas oil
Range, °C.: 250-350
Yield, vol %: 25
Diesel index: 51
Cetane no.: 52.6

Fuel oil
Range, °C.: 350+
Yield, vol %: 12.5
Sulfur, wt %: 0.11
Pour pt, °F.: 100

Note: Attaka is mixed wtih Badak crude and other streams and shipped with Attaka specifications

Badak, Indonesia

Santan terminal about 80 miles north of Balikpapan, Kalimantan/SBM some 4 miles offshore

Crude
Gravity, °API: 41.3
Vis., cSt @ 100° F.: 5.72
Pour pt, °F.: −15
Rvp @ 100° F., psi: 5.6
Total acid number, mg KOH/g: 0.11
Sulfur, wt %: 0.08
Wax, wt %: 7.35
Con. carbon, wt %: 0.313
Charac. factor, K UOP: 12.5
Note: Badak is mixed with Attaka crude and shipped with Attaka specifications.

Bekapai, Indonesia

Senipah marine terminal about 27 miles northeast of Balikpapan, Kalimantan/SBM about 6 miles offshore

Crude
Gravity, °API: 40
Sulfur, wt %; 0.08
Pour pt, °C.: −21
Rvp, psi: 1.9
Vis.,cSt @ 37.8° C.: 2.02
Con. carbon, wt %: 0.25
Asphaltenes, wt %: <0.05
V/Ni, ppm: <0.5/<0.5
Yield C_4 & lighter, wt %: 0.51

Gasoline
Range, °C.: C_5—100
Yield, wt %: 8.17
Gravity, °API: 63.6
Sulfur, ppm: <1
Paraffins, vol %: 45.8
Naphthenes, vol %: 47.6
Aromatics, vol %: 6.6
RON, clear: 73.8
RON + 0.6 g TEL/l: 88.5

Naphtha
Range, °C.: 100-185
Yield, wt %: 25.12
Gravity, °API: 49.1
Sulfur, ppm: 68
P/N/A, vol %: 33.2/48.9/17.9

Kerosine
Range, °C.: 185-230
Yield, wt %: 15.98
Gravity, °API: 42.5
Sulfur, wt %: 0.038
Aromatics, vol %: 18
Smoke pt, mm: 22
Freezing pt., °C.: −50.5

Gas oil
Range, °C.: 185-375
Yield, wt %: 52.06
Gravity, °API: 37.5
Sulfur, wt %: 0.083
Vis., cSt @ 37.8° C.: 2.62
Aniline pt, °C.: 67.6
Pour pt, °C.: −21

Residue
Range, °C.: 375+
Yield, wt %: 14.14
Gravity, °API: 18.9
Sulfur, wt %: 0.22
Vis., cSt @ 50° C.: 835
Pour pt, °C.: >+45
Con. carbon, wt %: 1.7
V/Ni, ppm: <2/2

Bekok, Malaysia

Piped ashore to terminal north of Chukai, Kuala Trengganu area, peninsular Malaysia as part of Tapis Blend

Crude
Gravity, °API: 49.07
Vis., cSt @ 100° F.: 1.74
Pour pt, °F.: 26
Sulfur, ppm: 210
Total nitrogen, wt %: 0.0136
Neutralization no., mg KOH/g: 0.035
Rvp, psi: 7.6
Con. carbon residue, wt %: 0.22
V/Ni, ppm: <l/<l
Wax, wt %: 6.05
Yield, C_4 & lighter: 2.7

Light naphtha
Range, °F.: C_5-145
Yield (VT), vol %: 7.05
RON, clear: 72

Heavy naphtha
Range, °F.: 145-330
Yield, vol %: 26.76
Sulfur, ppm: 5
Total nitrogen, ppm: 0.7
RON, clear: 45
Paraffins, wt %: 57.40
Naphthenes, wt %: 29.27
Aromatics, wt %: 13.33

Kerosine
Range, °F.: 330-450
Yield, vol %: 15.74
Sulfur, ppm: 20
Freezing pt, °F.: −45
Cloud pt, °F.: −47
Smoke pt, mm: 20
Cetane index: 57.33
Diesel index: 76.48
Vis., cSt @ 70° F.: 1.64

Distillate
Range, °F.: 450—650
Yield, vol %: 26.13
Gravity, °API: 41.65
Sulfur, ppm: 220
Cetane index: 64.34
Diesel index: 74.34
Aniline pt, °C.: 81.5
Vis., cSt @ 70° F.: 5.15

Heavy gas oil
Range, °F.: 680-975
Yield, vol %: 15.85
Gravity, °API: 32.84
Sulfur, ppm: 600
Total nitrogen, ppm: 533
Pour pt, °F.: 113
Con. carbon residue, wt %: 0.059
Sodium, ppm: 13.84
V/Ni, ppm: 0.008/<0.01
Vis., cSt @ 130° F.: 11.32

Atmospheric residue
Range, °F.: 650+
Yield, vol %: 21.62
Gravity, °API: 31.54
Sulfur, ppm: 700
Pour pt, °F.: 113
Con. carbon residue, wt %: 1.986
Sodium, ppm: 0.125
V/Ni, ppm: <0.002/<0.01
Vis., cSt @ 130° F.: 27.37

Note: Bekok is contributor to Tapis blend

Bintulu, Malaysia

Bintulu SBM terminal off Sarawak

Crude
Gravity, °API: 26.5
Vapor pressure, Kg/sq cm: 0.21
Pour pt, °C.: −5.0
Vis., cSt @ 56° C.: 4.54
Carbon residue, wt %: 1.69
Sulfur, wt %: 0.13
Acid no. KOH mg/g: 0.43
Nitrogen, ppm: 450
Distillation, °C.:
Ibp—28
5%—104
10%—135
15%—169
20%—199
25%—227
30%—245
35%—259
40%—273
45%—285
47%—290

Note: Bintulu comes solely from Temana field offshore Sarawak

Bunyu, Indonesia

Bunyu Island terminal off east coast of Kalimantan/Four point CBM

Crude
Gravity, °API: 31.7
Vis., cSt @ 100° F.: 2.67
Pour pt, °F.: 60
Rvp @ 100° F., psi: 1.0
Sulfur, wt %: 0.09
Wax, wt %: 8.3
Con. carbon residue, wt %: 0.39
Charac. factor, K UOP: 11.4

Gasoline
Range, °C.: C_5—175
Yield, vol %: 18.5
RON, clear: 74.9

Kerosine
Range, °C.: 175-300
Yield, vol %: 49.0
Smoke pt, mm: 10

Gas oil
Range, °C.: 300-350
Yield, vol %: 13.0
Diesel index: 41

Residue
Range, °C.: 350+
Yield, vol %: 19.5
Sulfur, wt %: 0.20
Pour pt, °F.: 115

Note: In late 1982 there were plans to mix Bunyu with Sembakung crude (37 °API). This assay of sample that did not contain Sembakung.

Champion Export, Brunei

Seria SBM

Crude
Gravity, °API: 23.9
Vis. @ 10° C., sq mm/sec: 21.1
Sulfur, wt %: 0.12
Wax, wt %: 0.4
Pour pt, °C.: < −36
Total acid no., mg KOH/g: 0.50
UOP K factor: 11.2
Yield light hydrocarbons, wt %: 0.70

Gasoline
Range, °C.: C_5—65
Yield, vol %: 0.4
Rvp, kPa: 70

Naphtha
Range, °C.: 65—100
Yield, vol %: 2.0
Sulfur, mg/kg: 24
RON, clear: 77
RON + 0.5 g Pb/l (TEL): 88

Naphtha
Range, °C.: 100-150
Yield, vol %: 4.5
SUlfur, mg/kg: 74
RON, clear: 71
Paraffins, wt %: 20
Naphthenes, wt %: 69
Aromatics, wt %: 11

Naphtha
Range, °C.: 150-200
Yield, vol %: 8.1
Density @ 15° C., kg/l: 0.827
Sulfur, mg/kg: 251
P/N/A, wt %: 15/69/16
Smoke pt, mm: 22

Kerosine
Range, °C.: 200-250
Yield, vol %: 16.2
Density @ 15° C.: 0.870
Sulfur, wt %; 0.06
Cloud pt, °C. < −60
Smoke pt, mm: 18
Aniline pt, °C.: 46.9
Cetane no.: 31

Gas oil
Range, °C.: 250-300
Yield, vol %: 22.6
Density @ 15° C., kg/l: 0.899
Vis. @ 40° C., sq mm/sec: 3.84
Pour pt, °C.: −57
Aromatics, wt %: 36
Smoke pt, mm: 15
Cetane no.: 29

Gas oil
Range, °C.: 300-350
Yield, vol %: 15.2
Density @ 15° C., kg/l: 0.930
Vis. @ 40° C., sq mm/sec: 10.2
Sulfur, wt %: 0.17

Heavy gas oil
Range, °C.: 350-370
Yield, vol %: 4.3
Density @ 15° C., kg/l: 0.951
Pour pt, °C.: −6
Total nitrogen, mg/kg: 194

Residue
Range, °C.: 370+
Yield, vol %: 26.4
Density @ 15° C.; kg/l: 0.991
Vis. @ 60° C., sq mm/sec: 912
Sulfur, wt %: 0.25
Pour pt, °C.: 21
V/Ni, mg/kg: <1/3

Note: Assay sample contained 67 vol % Champion crude, 18 vol % Magpie, and 15 vol % Seria Land Heavy.

Cinta, Indonesia

SBM and floating storage barge in Java Sea producing area

Crude
Gravity, °API: 33.4
Sulfur, wt %: 0.075
Pour pt, °F.: 105
Vis., cSt @ 100° F.: 64.34
Rvp, lb: 1.4
V/Ni, ppm: 0.1/9.5
Wax content, wt %: 30.3
C_5 & lighter, vol %: 3.143

Light naphtha
Range, °F.: C_5-180
Yield, vol %: 1.89
Sulfur, ppm: 2.3
RON, clear: 61.0
RON + 3 ml TEL/gal: 84.8

Naphtha
Range, °F.: 180-300
Yield, vol %: 4.84
Sulfur, ppm: 5.1
RON, clear: 48.4
RON + 3 ml TEL/gal: 74.4
Paraffins, vol %: 55.2
Olefins, vol %: 0.9
Naphthenes, vol %: 39.0
Aromatics, vol %: 4.9

Heavy naphtha
Range, °F.: 300-380
Yield, vol %: 4.02
Gravity, °API: 53.3
Sulfur, ppm: 12.0
P/O/N/A, vol %: 67.6/1.7/22.6/8.1

Kerosine
Range, °F.: 380-450
Yield, vol %: 2.04
Gravity, °API: 48.6
Sulfur, ppm: 91.4
Smoke pt, mm: 34
Pour pt, °F.: −30
Aniline pt, °F.: 156.7
Aromatics (FIA), %: 8.4
Cetane no.: 46.5
Diesel index: 76.2

Gas oil
Range, °F.: 450-650
Yield, vol %: 11.99
Gravity, °API: 42.2
Sulfur, wt %: 0.04
Cetane number: 58.5
Pour pt, °F.: 15
Vis., cSt @ 100° F.: 2.74

Heavy gas oil
Range, °F.: 650-1,050
Yield, vol %: 40.06
Gravity, °F.: 34.7
Sulfur, wt %: 0.065
Con. carbon, wt %: 0.07
Total nitrogen, wt %: 0.15
Basic nitrogen, wt %: 0.009
V/Ni, ppm: 0.1/0.1
Pour pt, °F.: 115
Aromatics (FIA), %: 15.6
Vis., cSt @ 130° F.: 10.0

Residue
Range, °F.: 650+
Yield, vol %: 74.3
Gravity, °API: 27.6
Sulfur, wt %: 0.09
Con. carbon, wt %: 6.05
V/Ni, ppm: 0.1/2.3
Pour pt, °F.: >120
Total nitrogen, wt %: 0.25
Vis., cSt @ 130° F.: 123.7

Daqing, China (see Taching)

Duri (Sumatran Heavy), Sumatra, Indonesia

Port of Dumai, Sumatra

Crude
Gravity, °API: 21.1
Sulfur, wt %: 0.20
Vis., cSt @ 122° F.: 131.9
Pour pt, °F.: 54
C_4 & lighter, vol %: 0.02

Light naphtha
Range (TBP), °F.: C_5-200
Yield, vol %: 0.48
Gravity, °API: 70.7
Sulfur, wt %: 0.007
Paraffins, vol %: 66.1
Naphtha, vol %: 33.5
Aromatics, vol %: 0.4

Heavy naphtha
Range (TBP), °F.: 200-340
Yield, vol %: 3.2
Gravity, °API: 51.1
Sulfur, wt %: 0.009
P/N/A, vol %: 31/62/7

Kerosine
Range (TBP), °F.: 340-460
Yield, vol %: 6.0
Gravity, °API: 36.3
Sulfur, wt %: 0.039
Smoke pt, mm: 18
Freeze pt, °F.: −73

Gas oil
Range (TBP), °F.: 460-650
Yield, vol %: 14.7
Gravity, °API: 27.4
Sulfur, vol %: 0.136
Pour pt, °F.: −1
Diesel index: 37.9

Reduced crude
Range (TBP), °F.: 650+
Yield, vol %: 75.6
Gravity, °API: 17.6
Sulfur, wt %: 0.21
Pour pt, °F.: 86
Vis., cSt @ 122° F.: 1,134
Rams. carbon, wt %: 7.8
V/Ni/Fe, wt % ppm: 1/16/0

Handil, Kalimantan, Indonesia

SBM about 6 miles offshore 27 miles northeast of Balikpapan

Crude
Gravity, °API: 32.75
Sulfur, wt %: 0.079
Pour pt, +85 °F.
Rvp, psi: 1.6
Vis., cSt @ 37.8° C.: 4.2
Con. carbon, wt%: 1
V/Ni, ppm: <0.5/<1
C_4 & lighter, wt %: 0.5

Gasoline
Range, °C.: C_5—75
Yield, wt %: 2.2
Gravity, °API: 69.4
Sulfur, ppm: 5
Paraffins, vol %: 64
Naphthenes, vol %: 20.2
Aromatics, vol %: 15.8
RON, clear: 79.7
RON + 0.6 g TEL/l: 89.2

Naphtha
Range, °C.: 75-145
Yield, wt %: 11.4
Gravity, °API: 45.8
Sulfur, ppm: 9
P/N/A, vol %: 21.8/33.3/44.9

Kerosine
Range, °C.: 145-250
Yield, wt %: 19.3
Gravity, °API: 33.6
Sulfur, ppm: 136
Aromatics (FIA), vol %: 44.2
Smoke pt, mm: 9
Freezing pt, °C.: −49

Gas oil
Range, °C.: 145-350
Yield, wt %: 46.3
Gravity, °API: 31.6
Sulfur, wt %: 0.061
Vis., cSt @ 20° C.: 2.49
Aniline pt, °C.: 51.8
Pour pt, °C.: −7

Residue
Range, °C.: 350+
Yield, wt %: 39.6
Gravity, °API: 25.1
Sulfur, wt %: 0.13
Vis., cSt @ 50° C.: 46.7
Pour pt, °C.: +45
Con. carbon, wt %: 2.6
V/Ni, ppm: <1/<2

Jatibarang, Java, Indonesia

SBM terminal about 6.5 nautical miles off north coast of Java

Crude
Gravity, °API: 29.0
Vis., cSt @ 122° F.: 83.8
Pour pt, °F.: 110
Rvp @ 100° F., psi: 0.2
Sulfur content, wt %: 0.07
Wax content, wt %: 24.6
Con. carbon residue, wt %: 7.53
Charac. factor, K UOP: 12.5

Gasoline
Range, °C.: Ibp-100
Yield, vol %: 3.6
RON, clear: 70.0

Naphtha
Range, °C.: 100-175
Yield, vol %: 7.9
Paraffins, vol %: 46.0
Naphthenes, vol %: 43.0
Aromatics, vol %: 11.0

Kerosine
Range, °C.: 175-250
Yield, vol %: 7.0
Smoke pt, mm: 21.0

Gas oil
Range, °C.: 250-350
Yield, vol %: 13.1
Diesel index: 67.5

Residue
Range, °C.: 350+
Yield, vol %: 68.4
Sulfur, wt %: 11.0
Pour pt, °F.: 120

Labuan Blend, Sabah, Malaysia

SBM in South China Sea off Labuan Island terminal

Crude
Gravity, °API: 33.2
Vis., cSt @ 70° F.: 4.41
Pour pt, °F.: 52
Sulfur, ppm: 917
Neut. no., mg KOH/g: 0.30
Rvp, psi: 3.52
Con. carbon residue, wt %: 2.54
V/Ni, ppm: 0.015/<0.002
Wax content, wt %: 2.34
Asphaltene content, wt %: 0.22
C_5 & lighter, wt %: 1.3

Light naphtha
Range, °F.: C_5-145
Yield, vol %: 2.0
Sulfur, ppm: <5
Rvp, psi: 12.4

Heavy naphtha
Range, °F.: 145-330
Yield, vol %: 18.80
Sulfur, ppm: 20
RON, clear: 67.0
RON + 3 cc TEL/U.S. gal: 85.0
Paraffins, wt %: 17.52
Naphthenes, wt %: 74.58
Aromatics, wt %: 7.89

Kerosine
Range, °F.: 330-450
Yield, vol %: 18.00
Gravity, °API: 38.70
Sulfur, ppm: 140
Freezing pt, °F.: −81.4
Pour pt, °F.: <−17
Smoke pt, mm: 21
Cetane index: 34.39
Diesel index: 44

Distillate
Range, °F.: 450-650
Yield, vol %: 38.27
Gravity, °API: 29.27
Sulfur, wt %: 0.07
Cloud pt, °F.: 19.4
Cetane index: 40.09
Diesel index: 38
Aniline pt, °C.: 55
Con. carbon residue, wt %: nil
Vis., cSt @ 70° F.: 6.43

Residue
Range, °F.: 650+
Yield, vol %: 21.96
Sulfur, wt %: 0.15
Nitrogen, ppm: 531
Pour pt, °F.: 89.6
Con. carbon residue, wt %: 1.62
V/Ni, ppm: 0.03/0.08
Vis., cSt @ 100° F.: 125.8

Heavy gas oil
Range, °F.: 680-975
Yield, vol %: 16.83
Gravity, °API: 15.79
Sulfur, wt %: 0.14
Total nitrogen, ppm: 586
Basic nitrogen, ppm: 144
Pour pt, °F.: 98
Con. carbon residue, wt %: 0.30
Vis., cSt @ 100° F.: 173.61

Note: Labuan Blend comes from offshore fields connected to North Sabah Trunk Line. They include Samarang and South Furious. Erb West, St. Joseph and Barton were to be added during late 1983.

Minas (Sumatran Light), Sumatra, Indonesia

Port of Dumai, Sumatra

Crude
Gravity, °API: 34.5
Sulfur, wt %: 0.081
Vis., cSt @ 122° F.: 12.4
Pour pt, °F.: 97
C_4 & lighter, vol %: 0.27

Light naphtha
Range (TBP), °F.: C_5-200
Yield, vol %: 2.83
Gravity, °API: 80.0
Sulfur, wt %: 0.001
Paraffins, vol %: 75
Naphtha, vol %: 25
Aromatics, vol %: nil

Heavy naphtha
Range (TBP), °F.: 200-340
Yield, vol %: 9.4
Gravity, °API: 60.2
Sulfur, wt %: 0.002
P/N/A, vol %: 62/30/8

Kerosine
Range (TBP), °F.: 340-460
Yield, vol %: 10.5
Gravity, °API: 47.2
Sulfur, wt %: 0.015
Smoke pt, mm: 35
Freeze pt, °F.: −34

Gas oil
Range (TBP), °F.: 460-650
Yield, vol %: 20.2
Gravity, °API: 39.6
Sulfur, vol %: 0.061
Pour pt, °F.: 44
Diesel index: 72

Reduced crude
Range (TBP), °F.: 650+
Yield, vol %: 56.8
Gravity, °API: 26.5
Sulfur, wt %: 0.15
Pour pt, °F.: 106
Vis., cSt @ 122° F.: 101.2
Rams. carbon, wt %: 5.1
V/Ni/Fe, wt % ppm: 1/15/10

Miri Light, Sarawak, Malaysia

SBMs off Miri terminal

Crude
Gravity, °API: 36.27
Vis., cSt @ 70° F.: 3.65
Pour pt, °F.: 34
Sulfur, ppm: 825
Total nitrogen, wt %: 0.0137
Neut. no., mg KOH/g: 0.175
Rvp, psi: 4.7
Con. carbon residue, wt %: 2.94
V/Ni, ppm: 0.012/<0.002
Wax content, wt %: 2.83
Asphaltene content, wt %: 0.258
C_5 & lighter, wt %: 2.2

Light naphtha
Range, °F.: C_5-145
Yield, vol %: 1.60
Sulfur, ppm: <5
Rvp, psi: 10.5

Heavy naphtha
Range, °F.: 145-330
Yield, vol %: 23.10
Sulfur, ppm: 17
RON, clear: 66.5
RON + 3 cc TEL/U.S. gal: 84.5
Paraffins, wt %: 14.55
Naphthenes, wt %: 68.94
Aromatics, wt %: 16.51

Kerosine
Range, °F.: 330-450
Yield, vol %: 15.80
Sulfur, ppm: 125
Freezing pt, °F.: < −70
Gravity, °API: 40.65
Smoke pt, mm: 21
Cetane index: 35.3
Diesel index: 47

Light distillate
Range, °F.: 450-650
Yield, vol %: 33.09
Gravity, °API: 30.99
Sulfur, ppm: 600
Cetane index: 41.1
Diesel index: 43
Aniline pt, °C.: 60
Vis., cSt @ 70° F.: 6.23

Residue
Range, °F.: 650 +
Yield, vol %: 25.26
Gravity, °API: 21.01
Sulfur, wt %: 0.17
Pour pt, °F.: 100.4
Con. carbon residue, wt %: 2.22
V/Ni, ppm: 0.030/<0.001
Vis., cSt @ 100° F.: 217.26

Heavy gas oil
Range, °F.: 680-975
Yield, vol %: 20.26
Gravity, °API: 20.71
Sulfur, ppm: 0.15
Total nitrogen, ppm: 584
Basic nitrogen, ppm: 95
Pour pt, °F.: 35
Vis., cSt @ 100° F.: 103.85

Note: Miri is blend of 7 offshore fields. Miri Land crude no longer produced.

Pulai, Malaysia

Piped ashore to terminal north of Chukai, Kuala Trengganu area, peninsular Malaysia, as part of Tapis Blend.

Crude
Gravity, °API: 42.52
Vis., cSt @ 70° F.: 2.12
Pour pt, °F.: 23
Sulfur, ppm: 160
Total nitrogen, ppm: 33.5
Rvp, psi: 2.7
Con. carbon residue, wt %: 0.11
V/Ni, ppm: 1.4/0.1
Wax content, wt %: 3.11
Asphaltene content, wt %: 0.31
C_4 & lighter, vol %: 0.45

Light naphtha
Range, °F.: C_5-145
Yield, vol %: 2.03
Sulfur, ppm <5

Heavy naphtha
Range, °F.: 145-330
Yield, vol %: 27.93
Sulfur, ppm: <5
RON, clear: <70
Paraffins, wt %: 31.83
Naphthenes, wt %: 26.44
Aromatics, wt %: 31.38

Kerosine
Range, °F.: 330-450
Yield, vol %: 27.85
Sulfur, ppm: 19
Freezing pt, °F.: −67
Pour pt, °F.: −66
Smoke pt, mm: 21
Cetane index: 43.17
Diesel index: 56.62
Vis., cSt @ 70° F.: 1.71

Light distillate
Range, °F.: 450-650
Yield, vol %: 34.14
Gravity, °API: 34.8
Sulfur, ppm: 270
Cloud pt, °F.: +14
Cetane index: 48.63
Diesel index: 54.04
Aniline pt, °C.: 68.5
Vis., cSt @ 70° F.: 5.01

Residue
Range, °F.: 650 +
Yield, vol %: 7.60
Gravity, °API: 28.20
Sulfur, ppm: 800
Nitrogen, ppm: 323
Pour pt, °F.: 102
Aniline pt, °C.: 91
Con. carbon residue, wt %: 1.58
V/Ni, ppm: <0.01/<0.01
Vis., cSt @ 130° F.: 17.53
Note: Pulai is contributor to Tapis Blend

Salawati, West Irian, Indonesia

Salawati marine terminal (breasting and mooring dolphins and storage barge) on Sele Strait

Crude
Gravity, °API: 38.0
Vis., cSt @ 100° F.: 4.2
Pour pt, °F.: −15
Rvp @ 100° F., psi: 0.6
Sulfur, wt %: 0.49
Wax content, wt %: 8.42
Con. carbon residue, wt %: 1.3
Charac. factor K UOP: 12.0

Gasoline
Range, °C.: C_5-94
Yield, vol %: 1.0

Naphtha
Range, °C.: 94-149
Yield, vol %: 10.7
Paraffins, vol %: 71.4
Naphthenes, vol %: 27.9
Aromatics, vol %: 0.8

Kerosine
Range, °C.: 149-260
Yield, vol %: 35.4
Smoke pt, mm: 35.5
Freezing pt, °F.: −28

Gas oil
Range, °C.: 260-344
Yield, vol %: 21.5
Cetane index: 58.6

Residue
Range, °C.: 344 +
Yield, vol %: 31.4
Sulfur, wt %: 1.1
Pour pt, °F.: 115

Sanga Sanga, Kalimantan, Indonesia

Crude
Gravity, °API: 25.7
Rvp, psi @ 100° F.: 0.8
Sulfur, wt %: 0.17
Pour pt, °F.: +5
V/Ni, ppm: nil/0.9
Vis., SUS @ 100° F.: 151.3
Con. carbon residue, wt %: 0.79

Naphtha
Range, °F.: Ibp-350
Yield, vol %: 13.2
Rvp, psi @ 100° F.: 2.7
Sulfur, wt %: 0.015

Kerosine
Range, °F.: 350-450
Yield, vol %: 12.4
Aniline pt, °C.: 118
Sulfur, wt %: 0.04
Smoke pt, mm: 16

Diesel
Range, °F.: 450-650
Yield, vol %: 41.6
Gravity, °API: 25.3
Aniline pt, °C.: 133
Cetane index (calc.): 36.5
Sulfur, wt %: 0.13
Pour pt, °F.: +25
Vis., SUS @ 100° F.: 41.6

Fuel oil
Range, °F.: 650 +
Yield, vol %: 32.8
Gravity, °API: 19.3
Sulfur, wt %: 0.31
Pour pt, °F.: +105
V/Ni, ppm: Nil/1.4

Sepinggan-Yakin Mixed (4:1), East Kalimantan, Indonesia

Lawi-Lawi terminal about 12 miles south of Balikpapan/SBM about 6 miles offshore in Makasar Straits

Crude
Gravity, °API: 31.7
Vis., cSt @ 100° F.: 3.16
Pour pt, °F.: 20
Rvp, psi @ 100° F.: 2.6
Total acid no., mg KOH/g: 0.3
Sulfur content, wt %: 0.11
Con. carbon residue, wt %: 0.54

Gasoline
Range, °C.: C_5-100
Yield, vol %: 1.5

Naphtha
Range, °C.: 100-175
Yield, vol %: 19.5

Kerosine
Range, °C.: 175-250
Yield, vol %: 21.5

Gas oil
Range, °C.: 250-350
Yield, vol %: 35.5

Fuel oil
Range, °C.: 350+
Yield, vol %: 22.0

Seria Light, Brunei

Lutong terminal

Crude
Gravity, °API: 36.2
Rvp, psi: 6.0
Sulfur, wt %: 0.07
Pour pt, °F.: 35
Vis., SSU @ 80° F.: 36.5
Yield, Ibp-113° F., vol %: 5.77

Gasoline
Range, °F.: 113-220
Yield, vol %: 10.23
RON + 3 cc TEL/gal: 85.0

Naphtha
Range, °F.: 220-390
Yield, vol %: 21.41
Paraffins, vol %: 35.9
Naphthenes, vol %: 34.6
Dinaphthenes, vol %: 11.8
Aromatics, vol %: 17.7

Light distillate
Range, °F.: 390-550
Yield, vol %: 26.63
Gravity, °API: 33.0
Cetane index: 35.0
Sulfur, wt %: 0.04
Aniline pt, °F.: 129.5
Pour pt, °F.: −35
Range, °F.: 550-650
Yield, vol %: 13.88
Gravity, °API: 29.0

Light gas oil
Range, °F.: 450-650
Yield, vol %: 31.74
Gravity, °API: 30.1
Cetane index: 40.7
Sulfur, wt %: 0.07

Heavy gas oil
Range, °F.: 650-971
Yield, vol %: 18.89
Gravity, °API: 18.0
Sulfur, wt %: 0.15
Total nitrogen, ppm: 513
Basic nitrogen, ppm: 262
Pour pt, °F.: 95
Carbon residue, wt %: 0.18

Vacuum flashed residue
Range, °F.: 971+
Yield, vol %: 3.19
Gravity, °API: 10.0
Sulfur, wt %: 0.32

Shengli, China

Qingdao terminal on Yellow Sea

Crude
Gravity, °API: 24.2
Rvp, psi: 0
Sulfur, wt %: 1.00
Pour pt, °F.: +70
Vis., SFS @ 122° F.: 48.3
Acid no.: 1.16

Light ends
Range, °F.: Ibp-160
Yield, vol %: 2.0

Light naphtha
Range, °F.: 160-290
Yield, vol %: 3.3
Paraffins, vol %: 45.9
Naphthenes, vol %: 44.7
Aromatics, vol %: 9.4

Heavy naphtha
Range, °F.: 290-390
Yield, vol %: 3.7
Gravity, °API: 47.5
Sulfur, wt %: 0.05
P/N/A, vol %: 48.9/30.9/20.2

Kerosine
Range, °F.: 390-500
Yield, vol %: 6.2
Gravity, °API: 39.9
Sulfur, wt %: 0.23
Olefins, vol %: 0.9
Aromatics, vol %: 16.5
Smoke pt, mm: 17
Freeze pt, °F.: −29.2

Diesel
Range, °F.: 500-660
Yield, vol %: 12.3
Gravity, °API: 34.7
Sulfur, wt %: 0.53
Pour pt, °F.: +40
Cetane index: 52.6
Cloud pt, °F.: +42

Light gas oil
Range, °F.: 660-780
Yield, vol %: 9.7
Gravity, °API: 31.4
Sulfur, wt %: 0.65
Vis., SSU @ 100° F.: 76.0
Pour pt, °F.: +80
Aniline pt, °F.: 183.0
UOP K factor: 12.1
Carbon residue, wt %: 0.06

Heavy gas oil
Range, °F.: 780-1,050
Yield, vol %: 26.4
Gravity, °API: 24.8
Sulfur, wt %: 0.79
Vis., SSU @ 210° F.: 78.3
Pour pt, °F.: +110
Aniline pt, °F.: 202.0
Carbon residue, wt %: 0.28

Bottoms
Range, °F.: 1,050+
Yield, vol %: 36.4
Gravity, °API: 11.7
Sulfur, wt %: 1.66
Vis., SSF @ 210° F.: 1,097.8
Carbon residue, wt %: 16.4

Soviet Export Blend, U.S.S.R.

Terminals: Ventspils, Baltic and Novorossysk, Black Sea

Crude
Gravity, °API: 32.5
Sulfur, wt %: 1.38
Rvp, kPa: 49.2
Pour pt, °C: −23
Vis. @ 20° C.: 11.5

Light naphtha
Range (TBP), °C.: Ibp-90
Yield, wt %: 10.3
Density @ 15° C., g/ml: 0.676
Sulfur, wt %: 0.005
Paraffins, wt %: 71.7
Naphthenes, wt %: 26.5
Aromatics, wt %: 1.8

Heavy naphtha
Range (TBP), °C.: 90-180
Yield, wt %: 11.3
Density @ 15 °C., g/ml: 0.761
Sulfur, wt %: 0.029
P/N/A, vol %: 38.5/52.0/9.5

Kerosine
Range (TBP), °C.: 180-220
Yield, wt %: 6.5
Density @ 15 °C., g/ml: 0.806
Sulfur, wt %: 0.15
Aromatics, vol %: 20.1
Freeze pt, °C.: −57
Smoke pt, mm: 25
Aniline pt, °C.: 62.5
Vis., cSt @ 20° C.: 1.73

Light gas oil
Range (TBP), °C.: 180-350
Yield, wt %: 24.3
Density @ 15° C., g/ml: 0.840
Cetane index (calc.): 49.5
Sulfur, wt %: 0.57
Pour pt, °C.: −29
Aniline pt, °C.: 67.5
Vis., cSt @ 20° C.: 3.69

Heavy gas oil
Range (TBP), °C.: 350-515
Yield, wt %: 29.4
Density @ 15° C., g/ml: 0.915
Sulfur, wt %: 1.9
Vis., cSt @ 50° C.: 26.0
V/Ni, ppm: 0.15/0.17

Long residuum
Range, °C.: 350
Yield, wt %: 54.1
Density @ 15° C., g/ml: 0.952
Sulfur, wt %: 2.59
Rams. carbon, wt %: 8.2
Vis., cSt @ 50° C.: 191

Short residuum
Range, °C.: 515
Yield, wt %: 26.4
Sulfur, wt %: 2.98
Rams. carbon, wt %: 16.4
Vis. @ 60° C.: 3.9
V/Ni, ppm: 154/53

Note: Crude on which this assay was based was shipped from Ventspils. It is claimed that crude from either port is of similar quality.

Taching (Daqing), China

Luda (Darien) terminal on Yellow Sea

Crude
Gravity, °API: 33.0
Sulfur, wt%: .078
Pour pt, °F.: +95

Light ends
Range, °F.: Ibp-160
Yield, vol %: 1.8

Light naphtha
Range, °F.: 160-290
Yield, vol %: 5.4
Sulfur, wt %: 0.0130
Paraffins, vol %: 46.6
Olefins, vol %: 0.4
Naphthenes, vol %: 50.4
Aromatics, vol %: 2.6

Heavy naphtha
Range, °F.: 290-390
Yield, vol %: 5.8

Sulfur, wt %: 0.010
P/O/N/A, vol %: 39.6/1.5/52.4/6.5

Kerosine
Range, °F.: 390-500
Yield, vol %: 7.7
Gravity, °API: 44.0
Sulfur, wt %: 0.0127
Olefins, vol %: 3.2
Aromatics, vol %: 11.1
Smoke pt, mm: 22
Freezing pt, °F.: −13.9

Diesel
Range, °F.: 500-635
Yield, vol %: 7.2
Gravity, °API: 39.2
Sulfur, wt %: 0.0390
Vis., SSU @ 100° F.: 40.2
Pour pt, °F.: +40
Aniline pt, °F.: 178.0
Diesel index: 69.8

Light gas oil
Range, °F.: 635-775
Yield, vol %: 16.3
Gravity, °API: 37.0
Sulfur, wt %: 0.0480
Vis., SSU @ 100° F.: 52.1
Pour pt, °F.: +80
Carbon resiude, wt %: 0.01

Heavy gas oil
Range, °F.: 775-932
Yield, vol %: 18.9
Gravity, °API: 31.4
Sulfur, wt %: 0.1140
Vis., SSU @ 210° F.: 48.1
Pour pt, °F.: +115
UOP K factor: 12.5
Carbon resiude, wt%: 0.03

Bottoms
Range, °F.: 932+
Yield, vol %: 36.9
Gravity, °API: 21.2
Sulfur, wt %: 0.14
Vis., SSF @ 210° F.: 52.2
Carbon residue, wt %: 7.3
V/Ni, ppm: 1.0/0

Tapis, Malaysia

Piped ashore to terminal north of Chukai, Kuala Trengganu area, peninsular Malaysia, as part of Tapis Blend

Crude
Gravity, °API: 44.30
Vis., cSt @ 70° F.: 2.69
Pour pt, °F.: 39
Sulfur, ppm: 230
Total nitrogen, ppm: 134
Basic nitrogen, ppm: 10.1
Neut. no., mg KOH/g: 0.04
Rvp, psi: 2.5
Con. carbon residue, wt %: 2.17
V/Ni, ppm: <0.002/0.17
Wax content, wt %: 5.75
Asphaltene content, wt %: 0.112
Yield, C_4 & lighter, vol %: 0.97

Light gasoline
Range, °F.: C_5-145
Yield, vol %: 2.97
Sulfur, ppm: <5
Rvp, psi: 10.4
RON, clear: 74
RON + 3 cc TEL/U.S. gal: 92.5
Paraffins, wt %: 84.15
Naphthenes, wt %: 13.22
Aromatics, wt %: 2.63

Heavy naphtha
Range, °F.: 145-330
Yield, vol %: 23.47
Sulfur, ppm: 13
RON, clear: 53
P/N/A, wt %: 40.26/31.08/28.66

Kerosine
Range, °F.: 330-450
Yield, vol %: 20.70
Sulfur, ppm: 23
Freezing pt, °F.: −40
Smoke pt, mm: 20
Cetane index: 55.87
Diesel index: 74

Light distillate
Range, °F.: 450-650
Yield, vol %: 34.27
Gravity, °API: 41.0
Sulfur, ppm: 135
Cetane index: 61.9
Aniline pt, °C.: 79.5
Vis., SUS @ 70° F.: 41.35

Residue
Range, °F.: 650+
Yield, vol %: 17.62
Gravity, °API: 29.58
Sulfur, ppm: 700
Pour pt, °F.: 108
Con. carbon residue, wt %: 2.024
V/Ni, ppm: 0.31/0.01
Vis., SUS @ 130° F.: 102.31

Note: Tapis is contributor to Tapis Blend

Tapis Blend, Malaysia

Piped ashore to terminal north of Chukar, Kuala Trengganu area, peninsular Malaysia

Tapis Blend comprises oil from six fields in the South China Sea. They are Tapis, Pulai, Bekok, Tiong, Tingge, and Kepong. The latter three fields only recently began contributing to blend and assays had not yet been run at mid 1983. Tapis crude originally made up 60% of blend, Pulai and Bekok 40%. Assays are presented for these three crudes.

Tembungo, Sabah, Malaysia

Production platform in offshore producing area

Crude
Gravity, °API: 37.4
Sulfur, wt %: 0.04
Pour pt, °F.: +25
Vis., cSt @ 100° F.: 2.0
Rvp, psi: 2.8
Salt content, lb/1,000 bbl: 2.3

Light naphtha
Range, °F.: C_5-160
Yield, vol %: 2.4
Gravity, °API: 81.0
Sulfur, wt %: 0.001
Rvp, psi: 12.6
Paraffins, vol %: 83.0
Naphthenes, vol %: 17.0
Aromatics, vol %: Nil

Heavy naphtha
Range, °F.: 160-300
Yield, vol %: 17.9
Gravity, °API: 53.0
Sulfur, wt %: 0.004
Paraffins, vol %: 27.0
Naphthenes, vol %: 59.0
Aromatics, vol %: 14.0

Light distillate
Range, °F.: 300-510
Yield, vol %: 35.7
Gravity, °API: 36.0
Sulfur, wt %: 0.04
Freeze point, °F.: −45 est.
Smoke pt, mm: 13.0
Paraffins, vol %: 30.0
Naphthenes, vol %: 36.0
Aromatics, vol %: 34.0

Heavy distillates
Range, °F.: 510-650
Yield, vol %: 28.9
Gravity, °API: 33.0
Sulfur, wt %: 0.06
Pour pt, °F.: +15.0
Aniline pt, °F.: 153.0
Diesel index: 50.5

Resid
Range, °F.: 650+
Yield, vol %: 13.5
Gravity, °API: 25.0
Sulfur, wt %: 0.14
Pour pt, °F.: 85.0
Vis., cSt @ 100° F.: 42.0
Con. carbon, wt %: 0.55

Udang, Natuna Sea, Indonesia

Storage vessel with SBM about 43 nautical miles north of Anambas Island

Crude
Gravity, °API: 38.0
Kin. vis. @ 130° F.: 8.71
Con. carbon residue, wt %: 3.0
Sulfur, wt %: 0.05
V/Ni, ppm: 0.9/3.5
Pour pt, °C.: +37.8
Rvp, psi: nil
C_4 & lighter, vol %: 0.36

Naphtha
Range (TBP), °F.: 90-375
Yield, vol %: 15.2
Gravity, °API: 63.3
Paraffins, vol %: 75.5
Naphthenes, vol %: 20.3
Sulfur, wt %: <0.005

Kerosine
Range, °F.: 375-520
Yield, vol %: 11.4
Gravity, °API: 47.7
Sulfur, wt %: 0.005
Aromatics, vol %: 6

Heavy distillate
Range, °F.: 520-700
Yield, vol %: 18.7
Gravity, °API: 41.6
Sulfur, wt %: 0.02

Gas oil
Range, °F.: 700-1,010
Yield, vol %: 34.6
Gravity, °API: 35.4
Sulfur, wt %: 0.04

Residue
Range, °F.: 1,010+
Yield, vol %: 19.7
Gravity, °API: 20.9
Sulfur, wt %: 0.10
Kin. vis. @ 210° F.: 150
Con. carbon residue, wt %: 12.2
V/Ni, ppm: 4/16

Walio, West Irian, Indonesia

Kasim marine terminal (CBM) between island of Jef Kasim and mainland Irian Jaya

Crude
Gravity, °API: 34.05
Vis., cSt @ 100° F.: 5.0
Rvp @ 100° C., psi: 3.7
Acid no., mg KOH/g: 0.30
Con. carbon residue, wt %: 2.18
Charac. factor K UOP: 11.7

Gasoline
Range, °C.: C_5-95
Yield, vol %: 4.5

Naphtha
Range, °C.: 95-185
Yield, vol %: 19.0
Paraffins, vol %: 63.3
Naphthenes, vol %: 30.7
Aromatics, vol %: 6.0

Kerosine
Range, °C.: 185-260
Yield, vol %: 16.7
Smoke pt, mm: 22.0
Freezing pt, °C.: −46

Gas oil
Range, °C.: 260-350
Yield, vol %: 20.0
Diesel index: 56.1

Fuel oil
Range, °C.: 350+
Yield, vol %: 39.8
Sulfur, wt %: 1.36
Pour pt, °F.: 100

Latin America

BCF 24, Venezuela

La Salina, Lake Maracaibo

Crude
Gravity, °API: 23.5
Sulfur, wt %: 1.85
Vis., SUS @ 100° F.: 192.2
Pour pt, °F.: −60
Yield, 0°(IVT) - −82° F., vol %: 1.53

Light naphtha
Range, °F.: 82-200
Yield, vol %: 3.80
Sulfur, wt %: 0.0011
Paraffins, %: 71.37
Naphthenes, %: 26.70
Aromatics, %: 1.93

Heavy naphtha
Range, °F.: 200-300
Yield, vol %: 5.0
Sp gr: 0.7565
Sulfur, wt %: 0.0066
P/N/A, %: 48.24/39.87/11.89
RON clear: 65.4

Naphtha
Range, °F.: 300-350
Yield, vol %: 2.82
P/N/A, %: 41.95/42.21/15.84

Kerosine
Range, °F.: 350-400
Yield, vol %: 3.14
P/N/A, %: 37.59/44.45/17.95
Sulfur, wt %: 0.1186
Freeze pt, °F.: −91.39
Smoke pt, mm: 22.25
Cetane no.: 46.06
Aniline pt, °F.: 128.05

Gas oil
Range, °F.: 400-500
Yield, vol %: 7.53
Gravity, °API: 37.37
Sulfur, wt %: 0.3027
Kin. vis. @ 122° F.: 1.51
Freeze pt, °F.: −63.27
Smoke pt, mm: 19.33
Aniline pt, °F: 136.44
Cetane no.: 42.20

Gas oil
Range, °F.: 500-550
Yield, vol %: 4.55

Gas oil
Range, °F.: 550-650
Yield, vol %: 9.73
Sulfur, wt %: 1.06
Gravity, °API: 29.07
Kin. vis. @ 122° F.: 4.62
Pour pt, °F.: 4.13
Smoke pt, mm: 7.22
Aniline pt, °F.: 150.73

Residue
Range, °F.: 650+
Yield, vol %: 61.91
Gravity, °API: 13.26
Sulfur, wt %: 2.58
Kin. vis. @ 122° F.: 2,295
Ni/V, ppm: 40/347

Bachaquero, Venezuela

La Salina, Lake Maracaibo

Crude
Gravity, °API: 16.8
Sulfur, wt %: 2.4
Vis., SUS @ 100° F.: 1,362
Pour pt, °F.: −10
Rvp, psi: 1.6
Yield, 0° (IVT) - −82° F., vol %: 0.80

Light naphtha
Range, °F.: 82-200
Yield, vol %: 2.44
Sulfur, wt %: 0.0075
Paraffins, %: 66.17
Naphthenes, %: 31.28
Aromatics, %: 2.55
RON clear: 71.7

Heavy naphtha
Range, °F.: 200-300
Yield, vol %: 3.54
Sulfur, wt %: 0.026
P/N/A, wt %: 29.38/58.96/11.66
RON clear: 66.7

Naphtha
Range, °F. 300-350
Yield, vol %: 1.81
Sp gr: 0.8018
Sulfur, wt %: 0.1107
P/N/A, %: 23.20/59.59/17.21

Kerosine
Range, °F.:350-400
Yield, vol %: 2.11
Sp gr: 0.8227
Sulfur, wt %: 0.19
P/N/A, %: 25.12/54.49/20.39
Freeze pt, °F.: −74.12
Smoke pt, mm: 17.75
Cetane no.: 48.56

Gas oil
Range, °F.: 400-500
Yield, vol %: 6.37
Gravity, °API: 35.43
Sulfur, wt %: 0.52
Aromatics, wt %: 25.29
Freeze pt, °F.: −66.62
Smoke pt, mm: 9.23
Cetane no.: 46.36
Aniline pt., °F.: 127.39
Cetane index: 39.98

Gas oil
Range, °F.: 500-550
Yield, vol %: 3.93

Gas oil
Range, °F.: 550-650
Yield, vol %: 8.95
Sulfur, wt %: 1.36
Pour pt, °F.: −47.99
Smoke pt, mm: 2.83
Aniline pt, °F.: 138.64

Residue
Range, °F.: 650+
Yield, vol %: 70.24
Gravity, °API: 9.39
Sulfur, wt %: 3.0
Kin. vis. @ 122° F.: 8,672
Ni/V, ppm: 74/435

Boscan, Venezuela

Bajo Grande, Lake Maracaibo

Crude
Gravity, °API: 10.10
Sulfur, wt %: 5.5
Vis. SUS @ 100° F.: 90,000
Pour pt, °F.: +50

Light naphtha
Range, °F.: 82-200
Yield, vol %: 0.55

Heavy naphtha
Range, °F.: 200-300
Yield, vol %: 1.32
Sulfur, wt %: 0.68
Paraffins, %: 53.28

Naphtha
Range, °F.: 300-350
Yield, vol %: 0.88
Sulfur, wt %: 1.28
Paraffins, %: 34.9

Kerosine
Range, °F.: 350-400
Yield, vol %: 1.28
Sulfur, wt %: 1.88
Aromatics, %: 24.04
Pour pt, °F.: −141.0
Smoke pt, mm: 16.0
Aniline pt, °F.: 112.69

Gas oil
Range, °F.: 400-500
Yield, vol %: 3.96
Gravity, °API: 34.0
Sulfur, wt %: 3.14
Kin. vis. @ 122° F.: 1.81
Pour pt, °F.: −77.53
Smoke pt, °F.: 16.11

Aniline pt, °F.: 113.83
Cetane index: 37.24

Gas oil
Range, °F.: 500-550
Yield, vol %: 2.66
Gravity, °API: 28.62
Sulfur, wt %: 4.02

Gas oil
Range, °F.: 550-650
Yield, vol %: 6.46
Gravity, °API: 25.54
Sulfur, wt %: 4.47
Pour pt, °F.: −10.9
Cetane no.: 38.0
Aniline pt, °F.: 117.3
Cetane index: 42.27

Residue
Range, °F.: 650+
Yield, vol %: 82.9
Sulfur, wt %: 5.86
Gravity, °API: 6.10
Sulfur, wt %: 5.86
Ni/V, ppm: 175/1,407
Kin. vis. @ 122° F.: 22,502

Ceuta, Venezuela

Puerto Miranda, Lake Maracaibo

Crude
Gravity, °API: 31.8
Sulfur, wt %: 1.2
Vis., SUS @ 100° F.: 62
Pour pt, °F.: −35
Rvp: 2.7
Yield, 0°(IVT) - −82° F., vol %: 2.10

Light naphtha
Range, °F.: 82-200
Yield, vol %: 7.51
Sulfur, wt %: 0.002
Paraffins, %: 75.69
Naphthenes, %: 19.85
Aromatics, %: 4.46
RON clear: 71.5

Heavy naphtha
Range, °F.: 200-300
Yield, vol %: 9.89
Sulfur, wt %: 0.01
P/N/A, %: 50.88/32.07/17.05
RON clear: 60.9

Naphtha
Range, °F.: 300-350
Yield, vol %: 5.36
P/N/A, %: 42.25/38.78/18.98

Kerosine
Range, °F.: 350-400
Yield, vol %: 5.28
Gravity, °API: 44.1
Sulfur, wt %: 0.054
P/N/A, %: 39.8/41.1/19.0
Smoke pt, mm: 21.39
Aniline pt, °F.: 122.8
Cetane index: 40.9

Gas oil
Range, °F.: 400-500
Yield, vol %: 9.93
Gravity, °API: 38.75
Sulfur, wt %: 0.33
Aromotics, %: 19.10
Smoke pt, mm: 19.59
Aniline pt, °F.: 136.18
Cetane index: 41.84

Gas oil
Range, °F.: 500-550
Yield, vol %: 5.0
Gravity, °API: 34.64
Sulfur, wt %: 0.72

Gas oil
Range, °F.: 550-650
Yield, vol %: 9.24
Gravity, °API: 30.17
Sulfur, wt %: 1.0
Aniline pt, °F.: 155.8
Cetane index: 48.03

Residue
Range, °F.: 650+
Yield, vol %: 45.69
Gravity, °API: 16.60
Sulfur, wt %: 2.05
Ni/V, ppm: 54/281

Galeota Mix (Trinidad Blend), Trinidad Tobago

Point Galeota SBM

Crude
Gravity, °API: 32.8
Sulfur, wt %: 0.27
Rvp, psi: 2.0
Pour pt, °F.: −5
Neut. no., mg KOH/g: 0.84
Rams. carbon, wt %: 0.5
Kin. vis., cSt @ 100° F.: 4.32
V/Ni, ppm: 0/1
Yield C_4 & lighter, vol %: 0.6

Naphtha
Range, °F.: C_5-200
Yield, vol %: 3.7
Sulfur, wt %: 0.010
Paraffins, vol %: 63.1
Naphthenes, vol %: 30.5
Aromatics, vol %: 6.4
RON clear: 73.1

Heavy naphtha
Range, °F.: 200-320
Yield, vol %: 8.7
Sulfur, wt %: 0.017
P/N/A, vol %: 39.4/44.9/15.7
RON clear: 63.8

Kerosine
Range, °F.: 320-520
Yield, vol %: 28.8
Gravity, °API: 36.6
Sulfur, wt %: 0.054
Aniline pt, °F.: 126.7
Diesel index: 46.3
Cetane index: 35.6
Freeze pt, °F.: −56
Smoke pt, mm: 20

Gas oil
Range, °F.: 520-650
Yield, vol %: 25.6
Gravity, °API: 30.3
Sulfur, wt %: 0.223
Aniline pt, °F.: 151.0
Diesel index: 45.8
Cetane index: 44.6
Pour pt, °F.: 11

Gas oil
Range, °F.: 650-850
Yield, vol %: 20.1
Gravity, °API: 26.6
Sulfur, wt %: 0.454
Nitrogen, wt %: 0.030
Vis., SUS @ 122° F.: 77.8

Residue
Range, °F.: 650+
Yield, vol %: 32.8
Gravity, °API: 24.2
Sulfur, wt %: 0.607
Pour pt, °F.: +65
Nitrogen, wt %: 0.086
Rams. carbon, wt %: 1.35
Vis., SUS @ 122° F.: 200.3
V/Ni, ppm: 1/1

Isthmus, Mexico

Pajaritos, Veracruz, and Salina Cruz (Pacific), Oaxaca

Crude
Gravity, °API @ 60° F.: 32.8
Sulfur, wt %: 1.51
Pour test, °F.: −15
Vis., SUS @ 70° F.: 65.53
Vis., SUS @ 100° F.: 43.91
Rvp, psi @ 100° F.: 6.4
Hydrogen sulfide, ppm: 102
NC_4 & lighter, wt %: 1.2

Light straight run
Range, °F.: 60-200
Yield, vol %: 9.1
Total sulfur, wt %: 0.046
RON clear: 62.6
RON + 3 ml TEL/gal: 82.4

Naphtha
Range, °F.: 60-400
Yield, vol %: 29.9
Paraffins, vol %: 64.40
Naphthenes, vol %: 21.02
Aromatics, vol %: 14.58
Total sulfur, wt %: 0.054
RON clear: 44.5
RON + 3 ml TEL/gal: 67.0

Kerosine
Range, °F.: 400-500
Yield, vol %: 12.5
Gravity, °API: 41.2
Freezing point, °F.: −36
P/N/A, vol %: 47.4/30.9/21.7
Total sulfur, wt %: 0.23
Aniline pt, °F.: 143.2
Smoke pt, mm: 22

Light gas oil
Range, °F.: 500-650
Yield, vol %: 16.0
Gravity, °API: 32.3
Pour pt, °F.: +25
P/N/A, vol %: 41.2/33.3/25.5
Total sulfur, wt %: 1.19
Carbon residue, Rams., wt %. 0.01
Aniline pt, °F.: 156.3
Cetane index: 52.5

Topped crude
Range, °F.: 650+
Yield, vol %: 40.4
Gravity, °API: 15.5
Vis., SUS @ 210° F.: 145.47
Vis., SUS @ 122° F.: 149.53
Pour pt, °F.: +55
Total sulfur, wt %: 2.94
Carbon residue, Rams., wt %: 8.08
Nitrogen, %: 0.2065
Ni/V, ppm: 14.8/67.1

Vacuum gas oil
Range, °F.: 650-1,100+
Yield, vol % (of crude): 28.5
Gravity, °API: 19.7
Aniline pt, °F.: 181.1
Vis., SUS @ 130° F.: 207.09
Pour pt, °F.: +110
Sulfur, wt %: 2.45
Carbon residue, Rams., wt %: 0.97
Ni/V, ppm: 4.3/-

Vacuum residue
Range, °F.: 1,100+
Yield, vol % (of crude): 11.9
Gravity, °API: 4.2
Vis., SFS @ 275° F.: 235.8
Sulfur, wt %: 4.18
Carbon residue, wt %: 23.08
Ni/V, ppm: 37/210

Lagomedio, Venezuela

Punta Palmas, Puerto Miranda/La Salina, Lake Maracaibo

Crude
Gravity, °API: 31.50
Sulfur, wt %: 1.17
Vis., SUS @ 100° F.: 56
Pour pt, °F.: −15
Rvp: 5.3
Yield, 0°(IVT) - −82° F., vol %: 1.96

Light naphtha
Range, °F.: 82-200
Yield, vol %: 6.10
Paraffins, %: 77.35
Naphthenes, %: 20.38
Aromatics, %: 2.28
RON clear: 65.6

Heavy naphtha
Range, °F.: 200-300
Yield, vol %: 9.27
Sulfur, wt %: 0.0
P/N/A, %: 55.4/33.0/11.5

Naphtha
Range, °F.: 300-350
Yield, vol %: 5.0
P/N/A, %: 50.0/32.5/17.5

Kerosine
Range, °F.: 350-400
Yield, vol %: 4.95
Sulfur, wt %: 0.027
Aromatics, %: 19.5
Smoke pt, mm: 24.5
Cetane no.: 56.12
Cetane index: 47.2

Gas oil
Range, °F.: 400-500
Yield, vol %: 9.39
Gravity, °API: 40.65
Sulfur, wt %: 0.17
Aromatics, %: 19.7
Smoke pt, mm: 20.61
Cetane no.: 50.02
Aniline pt, °F.: 147.34
Cetane index: 50.3

Gas oil
Range, °F.: 500-550
Yield, vol %: 4.69
Gravity, °API: 36.9
Sulfur, wt %: 0.44

Gas oil
Range, °F.: 550-650
Yield, vol %: 9.49
Gravity, °API: 33.4
Sulfur, wt %: 0.78
Cetane no.: 54.81
Aniline pt, °F.: 166.46
Cetane index: 58.1

Residue
Range, °F.: 650+
Yield, vol %: 49.15
Gravity, °API: 18.16
Sulfur, wt %: 1.97
Ni/V, ppm: 20/180

La Rosa Medium, Venezuela

La Salina, Lake Maracaibo

Crude
Gravity, °API: 25.3
Sulfur, wt %: 1.73
Pour pt, °F.: < −50
Rvp, psi: 4.0
Neut. no., mg KOH/g: 0.90
Vis. kin., cSt @ 122° F.: 24.0
Yield, C_5 & lighter: 1.34

Distillation

°F.	Yield, vol %: On crude	Cum.
C_2-C_5	1.34	1.34
158	2.47	3.80
212	2.33	6.13
302	5.40	11.52
401	6.69	18.21
509	7.81	26.01
650	13.22	39.23
698	5.63	44.85
752	6.33	51.17
752+	48.83	100.00

Residue
Range, °F.: 752+
Yield, vol %: 48.83
Gravity, °API: 12.1
Sulfur, wt %: 2.63
Con. carbon, wt %: 12.85
V/Ni, ppm: 413/43
Kin. vis., cSt @ 140° F.: 2,397

Leona, Venezuela

Puerto La Cruz, State of Anzoategui

Crude
Gravity, °API: 24.1
Sulfur, wt %: 1.5
Vis., SUS @ 122° F.: 305
Pour pt, °F.: −45
Rvp: 5.5
Yield, 0°(IVT)-82° F., vol %: 0.99

Naphtha
Range, °F.: 82-200
Yield, vol %: 4.34
RON clear: 63.9

Heavy naphtha
Range, °F.: 200-300
Yield, vol %: 6.71
Sulfur, wt %: 0.005
Paraffins, %: 49.85
Naphthenes, %: 32.13
Aromatics, %: 18.01

Naphtha
Range, °F.: 300-350
Yield, vol %: 3.34

Kerosine
Range, °F.: 350-400
Yield, vol %: 3.39
Sulfur, wt %: 0.05
P/N/A, %: 34.6/43.9/21.5
Smoke pt, mm: 18.15
Cetane no.: 44.78
Aniline pt, °F.: 135.13
Cetane index: 43.23

Gas oil
Range, °F.: 400-500
Yield, vol %: 10.51
Gravity, °API: 36.39
Sulfur, wt %: 0.19
Smoke pt, mm: 16.14
Cetane no.: 50.18
Aniline pt, °F.: 149.11
Cetane index: 46.50

Gas oil
Range, °F.: 500-550
Yield, vol %: 5.31
Sulfur, wt %: 0.56

Gas oil
Range, °F.: 550-650
Yield, vol %: 10.32
Gravity, °API: 28.46
Sulfur, wt %: 0.92
Pour pt, °F.: 17.79

Residue
Range, °F.: 650+
Yield, vol %: 55.11
Gravity, °API: 12.28
Sulfur, wt %: 2.3
Ni/V, ppm: 26/176

Loreto, Peru

Puerto Bayovar

Crude
Gravity, °API: 34.0
Sulfur, wt %: 0.29
Pour pt, °F.: 34
Vis., SUS @ 80° F.: 53.3
V/Ni, ppm: 63/34

Light naphtha
Range, °C.: Ibp-45
Yield, vol %: 2.41

Naphtha
Range, °C.: 45-104
Yield, vol %: 7.11
Paraffins, vol %: 68.3
Naphthenes, vol %: 29.9
Aromatics, vol %: 1.8

Heavy naphtha
Range, °C.: 104-199
Yield, vol %: 18.24
P/N/A, vol %: 49.9/39.2/10.3

Kerosine
Range, °C.: 199-288
Yield, vol %: 18.95
Sulfur, wt %: 0.05
Pour pt, °C.: −37
Cetane index: 46.3

Residue
Range, °C.: 343+
Yield, vol %: 41.3
Gravity, °API: 18.9
Sulfur, wt %: 0.51

Maya, Mexico

Pajaritos, Veracruz and Salina Cruz (Pacific), Oaxaca

Crude
Gravity, °API @ 60° F.: 22.0
Sulfur, wt %: 3.32
Pour test, °F.: 0
Vis., SUS @ 70° F.: 1,024.57
Vis., SUS @ 100° F.: 333.62
Rvp, psi @ 100° F.: 4.7
Hydrogen sulfide, ppm: 199
NC_4 & lighter, vol %: 1.5

Light straight run
Range, °F.: 60-200
Yield, vol %: 5.2
Total sulfur, wt %: 0.025
RON clear: 57.7
RON + 3 ml TEL/gal: 80.9

Naphtha
Range, °F.: 60-400
Yield, vol %: 19.7
Paraffins, vol %: 60.60
Naphthenes, vol %: 27.03
Aromatics, vol %: 12.37
Total sulfur, wt %: 0.213
RON clear: 38.1
RON + 3 ml TEL/gal: 57.6

Kerosine
Range, °F.: 400-500
Yield, vol %: 9.6
Gravity, °API: 39.6
Freezing pt, °F.: −29
P/N/A, vol %: 45.4/33.7/20.9
Total sulfur, wt %: 1.16
Aniline pt, °F.: 142.2
Smoke pt, mm: 20

Light gas oil
Range, °F.: 500-650
Yield, vol %: 12.8
Gravity, °API: 30.6
Pour pt, °F.: +30
P/N/A, vol %: 36.8/34.1/29.1
Total sulfur, wt %: 2.17
Carbon residue, Rams., wt %: 0.08
Aniline pt, °F.: 152.8
Cetane index: 51.0

Topped crude
Range, °F.: 650+
Yield, vol %: 56.4
Gravity, °API: 7.7
Vis., SUS @ 210° F.: 3,370.63
Vis., SUS @ 122° F.: 23,755.00
Pour pt, °F.: +115
Total sulfur, wt %: 5.04
Carbon residue, Rams., wt %: 17.83
Nitrogen, %: 0.4245
Ni/V, ppm: 87.8/535.0

Vacuum gas oil
Range, °F.: 650-1,100+
Yield, vol % (of crude): 25.2
Gravity, °API: 18.3
Aniline pt, °F.: 167.4
Vis., SUS @ 130° F.: 270.17
Pour pt, °F.: +105
Sulfur, wt %: 3.14
Carbon residue, Rams., wt %: 0.69
Ni/V, ppm: 0.9/1.9

Vacuum residue
Range, °F.: 1,100+
Yield, vol % (of crude): 31.2
Gravity, °API: 0.5
Vis., SUS @ 275° F.: Too hard
Sulfur, wt %: 5.78
Carbon residue, Rams., wt %: 26.2
Ni/V, ppm: 149/913

Merey, Venezuela

Puerto La Cruz, State of Anzoategui

Crude
Gravity, °API: 17.4
Sulfur, wt %: 2.2
Vis., SUS @ 100° F.: 1,207
Pour pt, °F.: −10
Yield, 0°(IVT)-82° F., vol %: 0.54

Light naphtha
Range, °F.: 82-200
Yield, vol %: 1.61
RON clear: 74.7

Heavy naphtha
Range, °F.: 200-300
Yield, vol %: 3.21
Sulfur, wt %: 0.01
Paraffins, vol %: 43.9
Naphthenes, vol %: 41.55
Aromatics, vol %: 15.17

Naphtha
Range, °F.: 300-350
Yield, vol %: 1.91
Sulfur, wt %: 0.036
P/N/A, vol %: 43.19/42.30/14.50

Kerosine
Range, °F.: 350-400
Yield, vol %: 2.37
Sulfur, wt %: 0.09
Aromatics, vol %: 13.95
Smoke pt, mm: 21.37
Aniline pt, °F.: 126.6

Gas oil
Range, °F.: 400-500
Yield, vol %: 7.21
Gravity, °API: 34.89
Sulfur, wt %: 0.33
Aromatics, vol %: 17.10
Smoke pt, mm: 13.45
Cetane no.: 35.62
Aniline pt, °F.: 135.51
Cetane index: 38.94

Gas oil
Range, °F.: 500-550
Yield, vol %: 4.52
Gravity, °API: 30.82
Sulfur, wt %: 0.7037

Gas oil
Range, °F.: 550-650
Yield, vol %: 10.47
Gravity, °API: 27.13
Sulfur, wt %: 1.15

Residue
Range, °F.: 650+
Yield, vol %: 68.16
Sulfur, wt %: 2.8
Ni/V, ppm: 74.77/301.08

Oriente, Ecuador

Puerto Balao/ Esmeraldas, Ecuador

Crude
Gravity, °API: 29.2
Sulfur, wt %: 1.01
Vis., cSt @ 104° F.: 13.0
Pour pt, °F.: 25.0
C_4 & lighter, vol %: 4.7
Rvp @ 100° F., psi: 3.70
Ni/V, ppm: 39/65

Light naphtha
Range, °F.: Ibp-200
Yield, vol %: 3.9
Sulfur, wt %: 0.001
Paraffins, vol %: 62.4
Naphthenes, vol %: 35.0
Aromatics, vol %: 2.6
RON clear: 67.3

Heavy naphtha
Range, °F.: 200-400
Yield, vol %: 17.3
Sulfur, wt %: 0.01
P/N/A, vol %: 44.9/45.8/9.3
RON clear: 45.9
Aniline pt, °F.: 130

Kerosine
Range, °F.: 400-500
Yield, vol %: 6.4
Gravity, °API: 40.6
Sulfur, wt %: 0.16
Vis., cSt @ 104° F.: 1.78
Smoke pt, mm: 20
Freezing pt, °F.: −41
Aniline pt, °F.: 142

Gas oil
Range, °F.: 500-620
Yield, vol %: 14.7
Gravity, °API: 35.1
Sulfur, wt %: 0.49
Vis., cSt @ 104° F.: 3.33
Pour pt, °F.: 5
Aniline pt, °F.: 153

Vacuum gas oil
Range, °F.: 620-1,000
Yield, vol %: 32.0
Gravity, °API: 25.2
Sulfur, wt %: 1.14
Vis., cSt @ 104° F.: 33.0
Pour pt, °F.: 90
Ni/V, ppm: 1/<1

Residue
Range, °F.: 620+
Yield, vol %: 51.5
Gravity, °API: 17.0
Sulfur, wt %: 1.66
Vis., cSt @ 104° F.: 649
Vis., cSt @ 212° F.: 34.1

Tia Juana Light, Venezuela

La Salina, State of Zulia

Crude
Gravity, °API: 32.1
Sulfur, wt %: 1.1
Kin. vis., SSU @ 100° F.: 60
Pour pt, °F.: −45
Yield, 0°(IVT)-82° F., vol %: 2.16

Light naphtha
Range, °F.: 82-200
Yield, vol %: 5.19

Heavy naphtha
Range, °F.: 200-300
Yield, vol %: 10.82
Sulfur, wt %: 0.0017
Paraffins, %: 65.99
Naphthenes, %: 24.30
Aromatics, %: 9.71
RON clear: 53.6

Naphtha
Range, °F.: 300-350
Yield, vol %: 4.82
Sulfur, wt %: 0.0077
P/N/A, %: 51.23/31.69/17.08

Kerosine
Range, °F.: 350-400
Yield, vol %: 4.64
Sulfur, wt %: 0.0281
P/N/A, %: 45.77/35.64/18.58
Smoke pt, mm: 23.37
Aniline pt, °F.: 134.99

Gas oil
Range, °F.: 400-500
Yield, vol %: 10.41
Gravity, °API: 40.72
Sulfur, wt %: 0.11
Smoke pt, mm: 14.99
Aniline pt, °F.: 147.31
Cetane index: 50.43

Gas oil
Range, °F.: 500-550
Yield, vol %: 4.96
Gravity, °API: 36.17
Sulfur, wt %: 0.4540
Smoke pt, mm: 11.99
Aniline pt, °F.: 158.47

Gas oil
Range, °F.: 550-650
Yield, vol %: 9.25
Gravity, °API: 32.39
Sulfur, wt %: 0.78
Smoke pt, mm: 14.42
Aniline pt, °F.: 168.05

Residue
Range, °F.: 650+
Yield, vol %: 47.75
Gravity, °API: 16.46
Sulfur, wt %: 1.87
Ni/V, ppm: 26/224

Tia Juana Pesado (Heavy), Venezuela

Puerto Miranda,
Lake Maracaibo

Crude
Gravity, °API: 12.10
Sulfur, wt %: 2.7
Kin. vis., cSt @ 122° F.: 2.983
Pour pt, °F.: 30
Yield, 0 (IVT)-82° F., vol %: 0.08

Naphtha
Range, °F.: 82-200
Yield, vol %: 0.10

Heavy naphtha
Range, °F.: 200-300
Yield, vol %: 0.53
Sulfur, wt %: 0.209

Naphtha
Range, °F.: 300-350
Yield, vol %: 0.52
Sulfur, wt %: 0.21

Kerosine
Range, °F.: 350-400
Yield, vol %: 0.90
Sulfur, wt %: 0.24
Aromatics, %: 13.31
Smoke pt, mm: 20.53
Aniline pt, °F.: 122.34

Gas oil
Range, °F.: 400-500
Yield, vol %: 4.52
Gravity, °API: 31.9
Sulfur, wt %: 0.6
Smoke pt, mm: 13.26
Aniline pt, °F.: 128.0
Cetane no.: 32.46
Cetane index: 33.27

Gas oil
Range, °F.: 500-550
Yield, vol %: 3.12
Sulfur, wt %: 0.93

Gas oil
Range, °F.: 550-650
Yield, vol %: 7.92
Gravity, °API: 22.96
Sulfur, wt %: 1.51

Residue
Range, °F.: 650+
Yield, vol %: 82.15
Gravity, °API: 8.94
Sulfur, wt %: 3.0
V, ppm: 532

Bombay High, India

Floating storage in Arabian Sea producing area

Crude
Gravity, °API: 39.35
Rvp @ 38° C., kg/sq cm: 0.34
Pour pt, °C.: +30
Kin. vis., cSt @ 40° C.: 3.28
Sulfur, wt %: 0.17
Salt content, lb/1,000 bbl: 11
Con. carbon, wt %: 1.2
Wax (E.H.), wt %: 10.6
Yield, vol %: 20.6
Gravity, °API: 58.42
Charac. factor K UOP: 11.7
V/Ni/Fe, ppm: 0.3/1.0/<0.3

Naphtha
Range, °C.: C_5–150
Yield, wt %: 18.6
Rvp, Kg/sq cm @ 38° C.: 0.42
Sulfur, total, ppm: 3.0
Mercaptan sulfur, ppm: 1.3
Paraffins, vol %: 53.7
Napthenes, vol %: 25.0
Aromatics, vol %: 21.3
RON, clear: 69.6
RON + 0.56 g Pb/l as TEL: 82.1

Kerosine
Range, °C.: 140–240
Yield, wt %: 19.3
Yield, vol %: 19.6
Gravity, °API: 43.75
Sulfur, total, ppm: 66
Mercaptan sulfur, ppm: 1.5
Flash pt, (Abel), °C.: 46.5
Smoke pt, mm: 19
Freezing pt, °C.: − 54.0
Aniline pt, °C.: 52.2
Kin. vis., cSt @ − 30° C.: 4.18
P/N/A, vol %: 39.8/23.9/26.3

Gas oil
Range, °C.: 240–370
Yield, wt %: 25.6
Yield, vol %: 25.2
Gravity, °API: 34.25
Pour pt, °C.: + 3
Kin. vis., cSt @ 37.8° C.: 4.17
Sulfur, total, wt %: 0.14
Aniline pt, °C.: 73.2
Diesel index: 56

Vacuum gas oil
Range, °C.: 370–550
Yield, wt %: 29.3
Yield, vol %: 27.5
Gravity, °API: 29.86
Pour pt, °C.: + 51
Kin. vis., cSt @ 70° C.: 11.0
Kin. vis., cSt @ 98.9° C.: 5.65
Con. carbon, wt %: 0.17
Asphaltene, wt %: 0.06
V/Ni/Cu/Fe, ppm: <0.3/<0.3/<0.1/<0.3

Residue
Range, °C.: 370+
Yield, vol %: 34.6
Yield, vol %: 31.0
Gravity, °API: 21.24
Pour pt, °C.: + 51
Sulfur, total, wt %: 0.38
Kin. vis., cSt @ 98.9° C.: 14.37
Kin. vis., cSt @ 70° C.: 24.66
Con. carbon, wt %: 4.33
Asphaltene, wt %: 1.22
V/Ni/Cu/Fe, ppm: 0.8/2.8/<0.1/0.35

Residue
Range, °C.: 550+
Yield, wt %: 5.3
Yield, vol %: 3.5
Gravity, °API: 7.86
Pour pt, °C.: +78
Sulfur, total, wt %: 0.77
Kin. vis., cSt @ 98.9° C.: 1,396.58
Con. carbon, wt %: 23.70
Asphaltene, wt %: 8.40
V/Ni/Cu/Fe, ppm: 5.0/18.0/<0.1/1.9

North America

Bow River Heavy, Alberta

*Bow River Pipe Lines Ltd. to Edmonton**

Crude
Gravity, °API: 26.7
Sulfur, g/kg: 21.0
Rvp, kPa: 37.2
Pour pt, °C.: −50.0
Con. carbon, wt %: 6.70
Vis., cSt @ 40° C.: 18.30
Ni/V, wt ppm: 20.7/54.0
C_3, yield, vol %: 0.41
C_4s, yield, vol %: 1.47

Naphtha
Range, °C.: C_5-190
Yield, vol %: 20.40
Sulfur, g/kg: 0.61
Paraffins, vol %: 65.50
Olefins, vol %: 0.40
Naphthenes, vol %: 26.80
Aromatics, vol %: 7.30

Kerosine
Range, °C.: 190-277
Yield, vol %: 13.10
Sulfur, g/kg: 4.40
P/O/N/A, vol %: 73.20/2.60/0.00/24.20
Aniline pt, °C.: 57.7
Pour pt, °C.: −60.6
Cetane no.: 44.0
Cetane index: 52.3
Smoke pt, mm: 27.0

Distillate
Range, °C.: 277-343
Yield, vol %: 10.80
Gravity, °API: 29.6
Sulfur, g/kg: 10.30
Aromatics, vol %: 55.10
Aniline pt, °C.: 63.9
Pour pt, °C.: − 35.0
Cetane no.: 46.0
Cetane index: 49.6
Vis., cSt @ 38° C.: 5.57

Gas oil
Range, °C.: 343-565°
Yield, vol %: 32.50
Gravity, °API: 20.9
Sulfur, g/kg: 21.00
Total nitrogen, wt %: 0.03
Pour pt, °C.: 12.1
Con. carbon, wt %: 0.60
Vis. cSt @ 38° C.: 57.30
Ni/V, ppm: 0.00/0.12

Residue
Range, °C.: 565+
Yield, vol %: 23.20
Gravity, °API: 5.3
Sulfur, g/kg: 38.20
Pour pt, °C.: 73.0
Vis., cSt @ 135° C.: 940
Penetration @ 25° C.: 19
Ni/V, wt ppm: 67.70/169.00

*Has access to Interprovincial and Trans Mountain pipelines at Edmonton

Cold Lake,* Alberta

Alberta Oil Sands Pipeline Ltd. to Edmonton†

Crude
Density, g/cu cm: 0.9031
Sulfur, wt %: 2.91
Vis., cSt @ 15° C.: 70.7

Neut. No.: 0.71
Nitrogen, wt %: 0.29
Pour pt, °C.: − 60
C_5 & lighter yield, vol %: 7.43

Naphtha
Range, °C.: 20-175
Yield, vol %: 30.0
RON clear: 63.7
Sulfur, wt %: 0.06

Distillate
Range, °C.: 175-295
Yield, vol %: 10.5
Density, kg/cu cm: 0.7983
Sulfur, wt %: 0.76
Aniline pt, °C.: 56
Vis., cSt @ 40° C.: 2.0
Freezing pt, °C.: − 61.5
Pour pt, °C.: − 51
Smoke pt, °C.: 18.4

Gas oil
Range, °C.: 343-517
Yield, vol %: 18.7
Density, kg/cu cm @ 15° C.: 0.9536
Sulfur, wt %: 2.96
Nitrogen, wt %: 0.08
Ni/V, wt ppm: 0.05/0.15

Residium
Range, °C.: 343 +
Yield, vol %: 51.6
Density, kg/cu cm: 1.0203
Sulfur, wt %: 4.8
Vis., cSt @ 60° C.: 7,750
Pour pt, °C.: + 51
Ni/V/Fe, wt ppm: 90.6/213.7/12.8

Asphalt
Range, °C.: 405 +
Yield, vol %: 47.8
Density @ 15° C., kg/cu m: 1,030.7
Pen. @ 25° C. (100/5): 343
Pen. @ 4° C. (100/5): 36
Pen. index: − 1.01
Vis. @ 60° C., Poises: 298
Vis. @ 100° C., cSt: 994

Asphalt
Range, °C.: 470 +
Yield, vol %: 37.7
Density @ 15° C., kg/cu m: 1,046.9
Pen. @ 25° C. (100/5): 60
Pen. @ 4° C. (100/5): 6
Pen. index: − 0.46
Vis. @ 60° C., Poises: 3,576
Vis. @ 100° C., cSt: 4,894

*Diluent added to crude to permit pipeline transportation. This assay made on blend of 28 wt % mixed condensate (gravity, °API, 58.9) and 72 wt % Cold Lake Crude that had the following characteristics:

Gravity, °API: 13.2
Density @ 15° C.: 0.9770
Sulfur, wt %: 4.11
Nitrogen, wt %: 0.42
Pour pt, °C.: − 4
Vis., cSt @ 40° C.: 1,057
Vis., cSt @ 80° C.: 98

†Has access to Interprovincial and Trans Mountain pipelines at Edmonton

Federated Light and Medium, Alberta

*Federated Pipe Line Ltd. to Edmonton**

Crude
Gravity, °API: 39.7
Sulfur, g/kg: 2.01
Total nitrogen, wt %: 0.11
Rvp, kPa: 31.0
Pour pt, °C.: − 10.0
Con. carbon, wt %: 1.46
Vis. cSt @ 40° C.: 3.30
Wax, wt %: 9.12
Neut. value, mg: 0.00
Ni/V, ppm: 0.07/0.00
C_4 & lighter, vol %: 3.43

Naphtha
Range, °C.: C_5-190
Yield, vol %: 30.90
Sulfur, g/kg: 0.05
Paraffins, vol %: 28.30
Naphthenes, vol %: 54.90
Aromatics, vol %: 16.80
RON clear: 56.4

Kerosine
Range, °C.: 190-277
Yield, vol %: 18.25
Gravity, °API: 41.0
Sulfur, g/kg: 0.68
Aromatics, vol %: 23.00
Aniline pt, °C.: 142.0
Pour pt, °C.: − 40.0
Freezing pt, °C.: − 39.0
Cetane no.: 47.0

Distillate
Range, °C.: 277-343
Yield, vol %: 13.73
Gravity, °API: 34.6
Sulfur, g/kg: 1.97
Aniline pt, °C.: 80.7
Pour pt, °C.: − 7.5
Cetane no.: 55.0
Cetane index: 49.0
Vis., cSt @ 38° C.: 4.43

Gas oil
Range, °C.: 343-565
Yield, vol %: 28.29
Gravity, °API: 25.6
Sulfur, g/kg: 3.10
Total nitrogen, wt %: 0.16
Pour pt, °C.: 40.0
Con. carbon, wt %: 0.45
Vis., cSt @ 50° C.: 29.32
Ni/V, wt ppm: 1.24/0.00

Residue
Range, °C.: 565 +
Yield, vol %: 8.83
Gravity, °API: 15.2
Sulfur, g/kg: 5.40
Pour pt, °C.: 26.0
Vis., cSt @ 135° C.: 30.64
Ni/V, wt ppm: 9.50/5.70

*Has access to Interprovincial and Trans Mountain pipelines at Edmonton.

Gulf Alberta, L & M

*Gulf Alberta Pipeline to Edmonton**

Crude
Gravity, °API: 35.1
Sulfur, g/kg: 9.80
H_2S, wt ppm: 58.1
Rvp, kPa: 36.4
Pour pt, °C.: − 27.5
Vis., cSt @ 40° C.: 4.86
Ni/V, wt ppm: 10.10/9.00
C_4 & lighter, yield, vol %: 3.50

Naphtha
Range, °C.: C_5-190
Yield, vol %: 30.60
Sulfur, g/kg: 0.36
Paraffins, vol %: 56.04
Olefins, vol %: 0.00
Naphthenes, vol %: 31.53
Aromatics, vol %: 12.43

Kerosine
Range, °C.: 190-277
Yield, vol %: 14.20
Gravity, °API: 39.9
Sulfur, g/kg: 2.76
Aromatics, vol %: 28.13
Aniline pt, °C.: 59.7
Pour pt, °C.: − 40.0
Cetane no.: 46.0
Cetane index: 49.0
Smoke pt, mm: 19.0

Distillate
Range, °C.: 277-343
Yield, vol %: 8.53
Gravity, °API: 22.1
Sulfur, g/kg: 7.67
Aniline pt, °C.: 70.0
Pour pt, °C.: − 10.0
Cetane no.: 52.0
Cetane index: 55.0
Vis., cSt @ 38° C.: 5.14

Gas oil
Range, °C.: 343-565
Yield, vol %: 31.43
Gravity, °API: 23.8
Sulfur, g/kg: 12.72
Total nitrogen, wt %: 0.13
Pour pt, °C.: 31.0
Con. carbon, wt %: 0.23
Vis., cSt @ 38° C.: 44.22
Ni/V, ppm: 0.40/0.00

Residue
Range, °C.: 565 +
Yield, vol %: 15.2
Gravity, °API: 14.6
Sulfur, g/kg: 23.87
Pour pt, °C.: 44.0
Vis., cSt @ 135° C.: 59.97
Ni/V, wt ppm: 24.10/25.10

*Access to Interprovincial and Trans Mountain pipelines at Edmonton.

Lloydminster,* Alberta and Saskatchewan

Husky Oil Operations Ltd. pipeline to Hardisty, Alta.†

Crude
Gravity, °API: 20.7
Sulfur, g/kg: 31.5
Rvp, kPa: 30.3
Pour pt, °C.: − 32.0
Con. carbon, wt %: 9.18
Vis., cSt @ 40° C.: 101.00
Neut. value, mg: 0.78
Ni/V, wt ppm: 52.70/10.50
C_4 & lighter, yield, vol %: 0.48

Naphtha
Range: C_5-190°
Yield, vol %: 19.50
Sulfur, g/kg: 0.79
Paraffins, vol %: 55.10
Olefins, vol %: 1.50
Naphthenes, vol %: 31.60
Aromatics, vol %: 11.80

Kerosine
Range, °C.: 190-277
Yield, vol %: 9.80
Gravity, °API: 34.9
Sulfur, g/kg: 5.05
Aromatics, vol %: 22.40
Aniline pt, °C.: 52.4
Pour pt, °C.: − 63.3
Cetane no.: 35.0
Smoke pt, mm: 19.0

Distillate
Range, °C.: 277-343
Yield, vol %: 9.50

Gravity, °API: 26.5
Sulfur, g/kg: 8.45
Aromatics, vol %: 38.90
Aniline pt, °C.: 56.5
Pour pt, °C.: − 31.1
Cetane no.: 40.0
Cetane index: 41.5
Vis., cSt @ 38° C.: 6.32

Gas oil
Range, °C.: 343-565
Yield, vol %: 25.20
Gravity, °API: 17.5
Sulfur, g/kg: 28.50
Aniline pt, °C.: 72.2
Pour pt, °C.: 1.7
Con. carbon, wt %: 0.55
Vis., cSt @ 38° C.: 155.00
Ni/V, wt ppm: 0.00/0.10

Residue
Range, °C.: 565+
Yield, vol %: 36.00
Gravity, °API: 2.9
Sulfur, g/kg: 56.90
Pour pt, °C.: 69.0
Con. carbon, wt %: 25.10
Vis., cSt @ 135° C.: 3,260
Ni/V, wt ppm: 123/231

*Crude has been blended with pipeline condensate to permit transportation. Typically 20-25% condensate is added to crude.
†Has access to Interprovincial pipeline at Hardisty.

Rainbow Light and Medium, Alberta

*Rainbow Pipe Line Co. Ltd. to Edmonton**

Crude
Gravity, °API: 40.7
Sulfur, g/kg: 5.00
H_2S, wt ppm: 10.2
Rvp, kPa: 33.9
Pour pt, °C.: 2.5
Con. carbon, wt %: 1.65
Vis., cSt @ 40° C.: 3.77
Wax, wt %: 20.40
Neut. value, mg: 0.08
Ni/V, wt ppm: 0.85/0.50
C_4 & lighter, yield, vol %: 3.40

Naphtha
Range, °C.: C_5-190
Yield, vol %: 38.70
Sulfur, g/kg: 0.14
Paraffins, vol %: 61.25
Naphthenes, vol %: 25.96
Aromatics, vol %: 12.79
RON clear: 51.2
MON clear: 51.4

Kerosine
Range, °C.: 190-277
Yield, vol %: 13.00
Gravity, °API: 42.2
Sulfur, g/kg: 1.20
Aromatics, vol %: 24.23
Aniline pt, °C.: 62.3
Pour pt, °C.: − 37.5
Freezing pt, °C.: − 35.0
Cetane no.: 46.0
Cetane index: 47.8
Smoke pt, mm: 20.0
Vis., cSt @ 40° C.: 1.55

Distillate
Range, °C.: 277-343
Yield, vol %: 11.50
Gravity, °API: 35.0
Sulfur, g/kg: 4.40
Aniline pt, °C.: 75.5
Pour pt, °C.: − 5.0
Cetane no.: 59.0
Cetane index: 55.0
Vis., cSt @ 38° C.: 4.51

Gas oil
Range, °C.: 343-565
Yield, vol %: 31.65
Sulfur, g/kg: 8.04
Total nitrogen, wt %: 0.69
Pour pt, °C.: 26.0
Con. carbon, wt %: 0.16
Vis., cSt @ 50° C.: 20.39
Asphaltenes, vol %: 4.10
Ni/V, wt ppm: 0.02/0.00

Residue
Range, °C.: 565+
Yield, vol %: 5.15
Gravity, °API: 19.6
Sulfur, g/kg: 10.71
Total nitrogen, wt %: 3.22
Pour pt, °C.: 28.0
Con. carbon, wt %: 11.11
Vis., cSt @ 135° C.: 27.82
Asphaltenes, wt %: 13.42
Ni/V, wt ppm: 4.60/2.90

*Has access to Interprovincial and Trans Mountain pipelines at Edmonton.

Rangeland-South L & M, Alberta

Rangeland Pipe Line Co. to Canadian/U.S. border near Carway, Alta.

Crude
Gravity, °API: 39.5
Sulfur, g/kg: 7.52
H_2S, wt ppm: 20.1
Rvp, kPa: 39.3
Pour pt, °C.: − 40.0
Con. carbon, wt %: 0.69
Vis., cSt @ 40° C.: 2.67
Wax, wt %: 12.44
Neut. value, mg: 0.12
Ni/V, wt ppm: 1.20/1.40
C_4 & lighter, yield, wt %: 3.22

Naphtha
Range, °C.: C_5-190
Yield, vol %: 38.75
Sulfur, g/kg: 0.12
Rvp, kPa: 41.1
Paraffins, vol %: 42.45
Naphthenes, vol %: 36.86
Aromatics, vol %: 20.69
RON clear: 58.5
MON clear: 57.3

Kerosine
Range, °C.: 190-277
Yield, vol %: 15.50
Gravity, °API: 38.3
Sulfur, g/kg: 1.87
Aromatics, vol %: 24.0
Aniline pt, °C.: 62.0
Pour pt, °C.: − 37.5
Freezing pt, °C.: − 28.5
Cetane no.: 48.0
Smoke pt, mm: 20.0

Distillate
Range, °C.: 277-343
Yield, vol %: 8.55
Gravity, °API: 32.0
Sulfur, g/kg: 4.79
Aniline pt, °C.: 71.0
Pour pt, °C.: − 7.5
Cetane no.: 51.0
Cetane index: 52.0
Vis., cSt @ 38° C.: 5.24

Gas oil
Range, °C.: 343-565
Yield, vol %: 33.20
Gravity, °API: 26.5
Sulfur, g/kg: 11.64
Total nitrogen, wt %: 0.62
Aniline pt, °C.: 86.6
Pour pt, °C.: 24.0
Con. carbon, wt %: 0.10
Vis., cSt @ 38° C.: 42.02

Residue
Range, °C.: 565+
Yield, vol %: 4.0
Gravity, °API: 21.7
Sulfur, g/kg: 12.19
Pour pt, °C.: 27.5
Vis., cSt @ 135° C.: 18.75
Asphaltenes, wt %: 10.13
Ni/V, wt ppm: 3.0/7.4

Wainwright—Kinsella,* Alberta

Husky Oil Operations Ltd. pipeline to Hardisty, Alta.†

Crude
Gravity, °API: 23.1
Sulfur, g/kg: 15.80
Rvp, kPa: 30.3
Pour pt, °C.: − 39.0
Con. carbon, wt %: 6.70
Vis., cSt @ 40° C.: 32.50
Ni/V, ppm: 40.30/79.90

Naphtha
Range, °C: C_5-190
Yield, vol %: 19.0
Sulfur, g/kg: 0.50
Paraffins, vol %: 52.50
Naphthenes, vol %: 37.80
Aromatics, vol %: 8.90

Kerosine
Range, °C.: 190-277
Yield, vol %: 12.00
Gravity, °API: 36.3
Sulfur, g/kg: 3.44
Aromatics, vol %: 22.80
Aniline pt, °C.: 56.7
Freezing pt, °C.: − 51.6
Cetane no.: 37.0
Smoke pt, mm: 26.0

Distillate
Range, °C.: 277-343
Yield, vol %: 11.0
Gravity, °API: 28.1
Sulfur, g/kg: 10.50
Aromatics, vol %: 33.70
Aniline pt, °C.: 60.5
Pour pt, °C.: − 22.0
Cetane no.: 42.0
Cetane index: 43.9
Vis., cSt @ 38° C.: 5.69

Gas oil
Range, °C.: 343-565
Yield, vol %: 26.00
Gravity, °API: 19.1
Sulfur, g/kg: 21.80
Total nitrogen, wt %: 0.03
Pour pt, °C.: 12.8
Vis., cSt @ 38° C.: 131.0
Con. carbon, wt %: 0.55
Ni/V, wt ppm: 0.11/0.00

Residue
Range, °C.: 565+
Yield, vol %: 32.0
Gravity, °API: 3.7
Sulfur, g/kg: 52.60
Pour pt, °C.: 74.0
Vis., cSt @ 135° C.: 212.00
Asphaltenes, wt %: 19.10
Ni/V, ppm: 110/222

*Note: crude blended with condensate to permit transportation.
†Has access to Interprovincial Pipeline.

U.S.

Alaska North Slope (ANS, Sadlerochit)

Trans Alaska Pipeline to Valdez Terminal

Crude
Gravity, °API: 26.4
Sulfur, wt %: 1.06
Pour pt, °F.: 0
Rvp, psi: 3.55
Kin. vis. @ 60° F.: 42.42
H_2S, lb/1,000 bbl: 0.35
Salt, lb/1,000 bbl: 32.7
Carbon residue, wt %: 4.40
Neut. no. (D974): 1.12
Ni/V, ppm: 11/26
Nitrogen, ppm: 2,090
C_4 & lighter, yield, vol %: 1.17

Light gasoline
Range, °F.: C_5—150
Yield, vol %: 2.2
Sulfur, wt %: <0.001
RON clear: 71.5
MON clear: 69.8
RON + 0.5g TEL/gal: 78.4

Naphtha
Range, °F.: 150—380
Yield, vol %: 15.6
Sulfur, wt %: 0.013
Paraffins, vol %: 39.7
Naphthenes, vol %: 43.3
Aromatics, vol %: 17.0

Distillate
Range, °F.: 380—650
Yield, vol %: 28.6
Gravity, °API: 33.1
Sulfur, wt %: 0.414
Pour pt, °F.: − 25
Cetane No.: 45.8
Total N_2, ppm: 79
Aromatics, vol %: 33.6

Blended gas oil
Range, °F.: 650—840
Yield, vol %: 16.4
Gravity, °API: 23.8
Sulfur, wt %: 1.10
Aniline pt, °C.: 74.7
Pour pt, °F.: 70
Carbon residue, %: 0.012
Total nitrogen, ppm: 950
Basic nitrogen: 0.03

Residue
Range, °F.: 650+
Yield, vol %: 52.4
Gravity, °API: 15.0
Sulfur, wt %: 1.63
Carbon residue, %: 8.82
Total nitrogen, ppm: 3,600
Pour pt, °F.: 80
Kin. vis. @ 210° F.: 47.54
Kin. vis. @ 275° F.: 15.55

Note: This assay is of Sadlerochit crude, originally the only component of North Slope crude. Kuparuk crude is now blended at a rate of about 120,000 b/d with Sadlerochit at pumpstation No. 1. Total ANS stream is about 1.6 million b/d. See Kuparuk analysis in this section.

Kuparuk,* Alaska

Trans Alaska Pipeline to Valdez Terminal

Crude
Gravity, °API: 23.0
Sulfur, wt %: 1.76
Pour pt, °F.: − 55
Rvp, psi: 2.6
Kin. vis. @ 60° F., cSt: 79.98
H_2S, lb/1,000 bbl: <5
Carbon residue, wt %: 7.37
Ni/V, ppm: 19/57
Nitrogen, ppm: 1,980
C_5 & lighter, vol %: 2.12

Light gasoline
Range (TBP), °F.: C_5—150
Yield, vol %: 1.6
Sulfur, wt %: 0.006

Naphtha
Range, °F.: 150—380
Yield, vol %: 14.5
Sulfur, wt %: 0.018
Paraffins, vol %: 38.3
Naphthenes, vol %: 47.0
Aromatics, vol %: 14.7

Distillate
Range, °F.: 380—650
Yield, vol %: 26.9
Sulfur, wt %: 0.66
Pour pt, °F.: − 25
Cetane No.: 45.4
Vis., cSt @ 100° F.: 3.083
Aromatics, wt %: 30.0

Gas oil
Range, °F.: 650—840
Yield, vol %: 18.9
Gravity, °API: 20.5
Sulfur, wt %: 1.79
Aniline pt, °C.: 104.3
Pour pt, °F.: 50
Kin. vis. @ 100° F.: 34.20
Carbon residue, wt %: 0.01
Total nitrogen, ppm: 600
Basic nitrogen, wt %: 0.02
V/Ni, ppm: <1

Residue
Range, °F.: 650+
Yield, vol %: 56.0
Gravity, °API: 11.7
Sulfur, wt %: 2.59
Carbon residue, wt %: 12.61
Pour pt, °F.: 40
Kin. vis. @ 210° F.: 97.15

*About 120,000 b/d of Kuparuk is blended with some 1.6 million b/d of Sadlerochit crude to produce North Slope crude. Kuparuk contribution is expected to double by early 1985.

West Sak,* Alaska

Not in production

Crude
Gravity, °API: 22.4
Sulfur, wt %: 1.82
Pour pt, °F.: − 50
Rvp, psi: 2.70
Kin. vis. @ 60° F.: 95.92
Carbon residue, wt %: 7.62
Ni/V, ppm: 22/61
Neut. no. (D974): 0.68
C_4 & lighter, yield, vol %: 0.63

Light gasoline
Range, °F.: C_5—150
Yield, vol %: 1.9
Sulfur, wt %: 0.004

Naphtha
Range, °F.: 150—380
Yield, vol %: 14.4
Sulfur, wt %: 0.018
Paraffins, vol %: 36.4
Naphthenes, vol %: 48.2
Aromatics, vol %: 15.4

Distillate
Range, °F.: 380—650
Yield, vol %: 27.5
Gravity, °API: 31.6
Sulfur, wt %: 0.700
Pour pt, °F.: − 35
Cetane no.: 42.1
Aromatics, vol %: 31.4
Vis., cSt @ 100° F.: 3.34

Gas oil
Range, °F.: 650—840
Yield, vol %: 16.6
Gravity, °API: 21.1
Sulfur, wt %: 1.81
Pour pt, °F.: 60
Kin. vis. @ 100° F.: 43.99
Total nitrogen, ppm: 840
Basic nitrogen: 0.023

Residue
Range, °F.: 650+
Yield, vol %: 55.6
Gravity, °API: 10.8
Sulfur, wt %: 2.53
Carbon residue, wt %: 13.15
Pour pt, °F.: 45
Kin. vis. @ 210° F 135.3
Pentane insoluble, wt %: 14.97

*Crude not in production, but pilot program is underway in Kuparuk area to determine feasibility. Assay sample obtained during drill stem test.

Crude oil streams by country of origin*

Abu Dhabi, U.A.E.
Abu Al Bu Khoosh—Cie. Francaise des Petroles
Murban—Abu Dhabi National Oil Co.
Umm Shaif (Abu Dhabi Marine)—Adnoc
Zakum (Lower Zakum)—Adnoc

Algeria
Saharan Blend—Sonatrach
Zarzaitine—Sonatrach

Angola
Cabinda—Cabinda Gulf Oil Co.
Soyo Blend—Cia. de Petroles de Angola and Texaco Angola

Brunei
Champion Export—Brunei Shell
Seria Light—Brunei Shell

Cameroon
Kole Marine Blend—Elf Serepca

Canada
Bow River Heavy—Alberta Petroleum Marketing Commission
Cold Lake—Esso Petroleum Canada/APMC
Federated—APMC/Home Oil Ltd.
Gulf Alberta L & M—APMC/Gulf Canada
LLoydminster—Husky Oil Operations Ltd.
Rainbow Light & Medium—APMC/Mobil Oil Canada
Rangeland South—APMC/Dome Petroleum Ltd.
Wainwright-Kinsella—APMC/Husky Oil Operations Ltd.

China
Shengli—Petroleum Corp. of PRC
Taching (Daqing)—Petroleum Corp. of PRC

Congo (Brazzaville)
Djeno Blend (Djeno Melange)—Elf Congo

Denmark
Dan—Dansk Undergrunds Consortium (DUC)
Gorm—DUC

Divided Zone
Burgan (Wafra)—Getty and Kuwait Oil Co.
Eocene (Wafra)—Getty and Kuwait Oil Co.
Hout—Arabian Oil Co.
Khafji—AOC

Dubai, U.A.E
Dubai (Fateh)—Dubai Petroleum Co.

Ecuador
Oriente—Texaco

Egypt
Belayim—AGIP
Gulf of Suez Mix—Amoco

Gabon
Gamba—Elf Gabon
Lucina Marine—Elf Gabon
Mandji—Elf Gabon

Ghana
Salt Pond—Agri-Petco

India
Bombay High—Oil & Natural Gas Commission

Indonesia
Ardjuna—Atlantic Richfield Indonesia Inc.
Arimbi—ARCO Indonesia
Attaka—Union Oil Co. of Indonesia
Badak—Roy M. Huffington Inc.
Bekapai—Total Indonesie
Bunyu—Pertamina
Cinta—Independent Indonesian American Petroleum Co.
Duri (Sumatran Heavy)—Caltex Pacific Indonesia
Handil—Total Indonesie
Jatibarang—Pertamina
Minas (Sumatran Light)—Caltex Pacific Indonesia
Salawati—Phillips Petroleum Co., Indonesia
Sanga Sanga—Tesoro
Sepinggan—Yakin Mixed (4:1)—Union Oil Co. of Indonesia
Udang—Conoco of Indonesia
Walio—Petromer Trend Corp.

Iran
Aboozar (Ardeshir)—National Iranian Oil Co.
Bahrgansar/Nowruz (Sirip Blend)—NIOC
Dorrood (Darius)—NIOC
Foroozan (Fereidoon)—NIOC
Iranian Heavy—NIOC
Iranian Light—NIOC
Rostam—NIOC
Salmon (Sassan)—NIOC
Sirri—NIOC
Soroosh (Cyrus), Iran—NIOC

Iraq
Basrah Heavy—Iraq National Oil Co.
Basrah Light—INOC
Basrah Medium—INOC
Kirkuk Blend—INOC

Ivory Coast
Espoir—Phillips Petroleum Co. Ivory Coast

Kuwait
Kuwait—Kuwait Oil Co.

Libya
Amna (high pour)—Libyan National Oil Corp.
Brega—LNOC
Bu Attifel—AGIP
Es Sider—Oasis
Sarir—LNOC
Sirtica—LNOC
Zueitina—Occidental

Malaysia
Bekok—Esso Malaysia
Bintulu—Shell Malaysia
Labuan Blend—Shell Malaysia
Miri Light—Shell Malaysia
Pulai—Esso Malaysia
Tapis—Esso Malaysia
Tapis Blend—Esso Malaysia
Tembungo—Esso Malaysia

Mexico
Isthmus—Pemex
Maya—Pemex

Nigeria
Bonny Light—Shell
Bonny Medium—Shell
Brass River—Phillips Oil Co. (Nigeria)
Escravos—Gulf Oil Co. (Nigeria)
Forcados Blend—Shell
Pennington—Texaco Overseas (Nigeria)
Qua Iboe (Nigerian Light)—Mobil Oil Nigeria

Norway
Ekofisk—Phillips Petroleum
Gullfaks—Statoil
Murchison—Conoco
Statfjord—Mobil

Oman
Oman Export—Petroleum Development (Oman) Ltd. and Elf Group

Qatar
Dukhan (Qatar land)—Qatar General Petroleum Corp.
Qatar Marine—QGPC

Saudi Arabia
Arabian Heavy (Safaniya)—Arabian American Oil Co.
Arabian Light—Aramco
Arabian Light (Berri)—Aramco
Arabian Medium (Khursaniyah)—Aramco
Arabian Medium (Zuluf/Marjan)—Aramco

Sharjah, U.A.E
Mubarek—Buttes Resources Co.

Syria
Souedie—Syrian Petroleum Co.

Trinidad
Galeota Mix (Trinidad Blend)—Amoco

Tunisia
Ashtart—Elf Aquitaine
El Borma—AGIP

United Kingdom
Argyll—Hamilton Bros.
Auk—Shell/Esso
Beatrice—Britoil
Beryl—Mobil
Brae—Marathon
Brent—Shell/Esso
Brent Blend
Buchan—BP
Cormorant, North—Shell/Esso
Cormorant, South (Cormorant "A")—Shell/Esso
Dunlin—Shell/Esso
Flotta—Occidental/Texaco
Forties—BP
Fulmar—Shell/Esso
Magnus—BP
Maureen—Phillips Petroleum
Montrose—Amoco
Murchison—Conoco
Ninian Blend—Chevron/Union/BP
Statfjord—Conoco
Tartan—Texaco
Thistle—Britoil

U.S.
Alaska North Slope (ANS, Sadlerochit)—Sohio/Exxon/ARCO
Kuparuk—ARCO
West Sak—ARCO

U.S.S.R.
Soviet Export Blend—V/O Sojuznefteexport

Venezuela
BCF 24—Affiliate of Petroleos de Venezuela
Bachaquero—Affiliate of Petroleos de Venezuela
Boscan—Affiliate of Petroleos de Venezuela
Ceuta—Affiliate of Petroleos de Venezuela
Lagomedio—Affiliate of Petroleos de Venezuela
La Rosa—Affiliate of Petroleos de Venezuela
Leona—Affiliate of Petroleos de Venezuela
Merey—Affiliate of Petroleos de Venezuela
Tia Juana Light—Affiliate of Petroleos de Venezuela
Tia Juana Pesado—Affiliate of Petroleos de Venezuela

Zaire
Zaire—Zaire Gulf Oil Co.

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*Names in parentheses are former or secondary names of crudes. Companies listed are primary operators or sales contacts.

Colombia's Caño Limón crude ready for export

Richard Corbett
Refining Editor

The completion of the Caño Limón pipeline and offshore loading facilities last month put Colombia's new Caño Limón crude into the world crude oil trade. Operators of the field, Empresa Colombia de Petroleos (Ecopetrol), Occidental de Colombia Inc., and Shell de Colombia Inc., expect an initial tanker loading capability of 90,000 b/d with total capacity reaching 250,000 b/d in by July.

The crude oil will be loaded from a tanker-loading facility and a floating storage unit located offshore in the Carribean Sea at the Covenas marine terminal. The loading facility will have two CALM buoys each capable of handling 40,000 bbl/hr, and will be able to handle two shuttle tankers at once. Information regarding assays in this series, is in OGJ, Apr. 11, 1983.

Caño Limón, Colombia

Covenas terminal to two CALM in Carribean Sea

Crude
Gravity, °API: 30.8
Sulfur, wt %: 0.47
Salt, lb/1,000 bbl: 2.0
Pour pt.; °F.: 60
Vis., cSt @ 100° F.: 12.54
Vis., cSt @ 120° F.: 8.19
Neut. No., mg KOH/g: 0.27
Rvp, psi: 0.7
H_2S, scf/100 gal crude: 0.02

Light naphtha
Range, °F.: IBP −220
Gravity, °API: 72.6
Yield, vol %: 3.94
Sulfur, wt %: 0.02
Mercaptan sulfur, vol %: 0.0002
Paraffins, vol %: 76.2
Naphthenes, vol %: 23.2
Aromatics, vol %: 0.6
Rvp, psi: 8.4

Naphtha
Range, °F.: 220-300
Gravity, °API: 59.3
Yield, vol %: 6.83
Sulfur, wt %: 0.01
Paraffins, vol %: 55.9
Naphthenes, vol %: 42.5
Aromatics, vol %: 1.6

Heavy naphtha
Range, °F.: 300-360
Gravity, °API: 51.9
Yield, vol %: 5.64
Sulfur, wt %: 0.01
Paraffins, vol %: 52.7
Naphthenes, vol %: 43.9
Aromatics, vol %: 3.4

Kerosine
Range, °F.: 360-500
Gravity, °API: 42.2
Yield, vol %: 21.09
Sulfur, wt %: 0.08
Mercaptan sulfur, vol %: 0.0004
Doctor: sweet
Smoke pt., mm: 22
Aniline pt., °F.: 163
Diesel index: 68.8
Pour pt., °F.: −60
W&N factor: 11.9
Vis., cSt @ 100° F.: 1.95

Light gas oil
Range, °F.: 500-700
Gravity, °API: 33.0
Yield, vol %: 22.04
Aniline pt., °F.: 182
Diesel index: 60.1
Pour pt., °F.: 30
Carbon residue, Rams., wt %: 0.08
Sulfur, wt %: 0.33
W&N factor: 11.9
Vis. cSt @ 100° F.: 7.16
Vis. cSt @ 210° F.: 2.04
Viscosity index: 82.4
Refractive index @ 67° C.: 1.4604
Basic nitrogen, wt %: 0.0081
Bromine No.: 5.7
V/Fe/Ni, ppm: 0.05/0.05/0.05

Atmospheric residuum
Range, °F.: 700+
Gravity, °API: 15.1
Yield, vol %: 39.89
Pour pt., °F.: 100
Carbon residue, Rams, wt %: 9.91
Sulfur, wt %: 0.84
W&N factor: 11.7
Vis., cSt @ 100° F.: 3,700.0
Vis., cSt @ 210° F.: 61.03
Viscosity index: 22.5

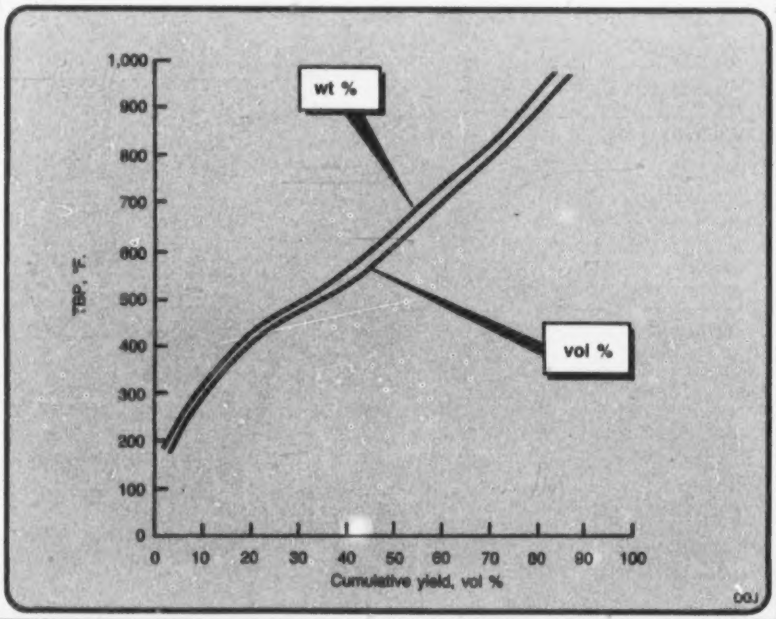
Vacuum gas oil
Range, °F.: 700-800
Gravity, °API: 26.5
Yield, vol %: 3.16
Aniline pt., °F.: 200
Diesel index: 53.0
Pour pt., °F.: 90
Carbon residue, Rams., wt %: 0.32
Sulfur, wt %: 0.52
W&N factor: 12.0
Vis., cSt @ 100° F.: 34.00
Vis., cSt @ 210° F.: 4.83
Viscosity index: 49.6
Refractive index @ 67° C.: 1.4766
Basic nitrogen, wt %: 0.0225
Bromine No.: 6.8
V/Fe/Ni, ppm: 0.05/0.20/1.40

Vacuum gas oil
Range, °F.: 800-1,000
Gravity, °API: 24.1
Yield, vol %: 15.01
Aniline pt., °F.: 210
Diesel index: 50.6
Pour pt., °F.: 105
Carbon residue, Rams, wt %: 0.44
Sulfur, wt %: 0.54
W&N factor: 12.0
Vis., cSt @ 100° F.: 65.00
Vis., cSt @ 210° F.: 6.72
Viscosity index: 43.1
Refractive index @ 67° C.: 1.4837
Basic nitrogen, wt %: 0.0289
Bromine No.: 10.0
V/Fe/Ni, ppm: 0.05/0.05/0.70

Vacuum residuum
Range, °F.: 1,000 +
Gravity, °API: 8.1
Yield, vol %: 21.74
Carbon residue, Rams., wt %: 19.26
Sulfur, wt %: 1.10
V/Fe/Ni, ppm: 41.5/12.00/95.00

Fig. 1

Cano Limon crude oil distillation



Two high-quality onshore crude oils, Sharjah

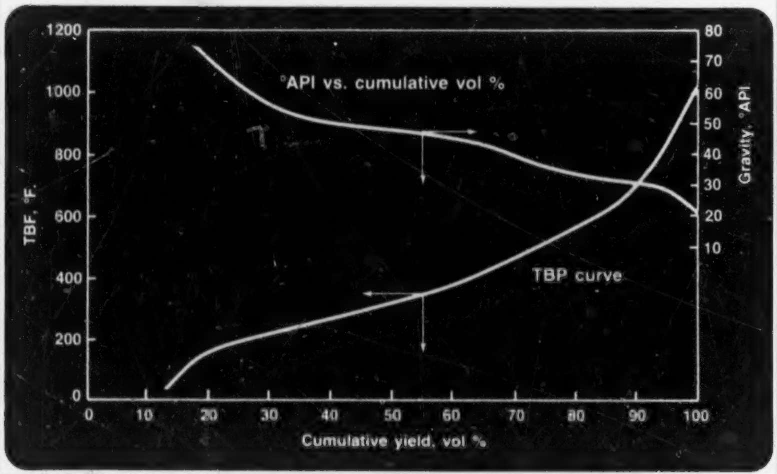
Richard A. Corbett
Refining Editor

Two northern U.A.E. condensates are actually considered high-quality crude oils. Both have respectable yields in the gas-oil range. Sharjah Condensate is produced from the Saaja gas/condensate field in Sharjah, U.A.E. Initial production, which began in mid-1982, is now 60,000 b/d.

The condensate is transported to the Hamriyah terminal through a 20-mile, 12-in. pipeline. From the terminal, the condensate travels through a 30-in. pipeline to a single point mooring (SPM) buoy in the Persion Gulf. The SPM can handle 250,000 dwt tankers.

Margham Light is produced in Dubai. Production from the Margham gas/condensate field, discovered in 1982, is presently 25,000 b/d. The condensate moves by pipeline to the new Port of Jebal Ali outside Dubai which can handle very large crude tankers. Information regarding these assays, and previous assays in the series, is in OGJ, Apr. 11, 1983.

Sharjah condensate



Sharjah Condensate, Sharjah, U.A.E.

Hamriyah terminal to SPM in Persian Gulf

Crude
Gravity, °API: 49.7
Sp gr, 60° F.: 0.7809
Sulfur, wt %: 0.10
Rvp, psi: 10.2
Pour pt., °F.: −25
Nuet no., mg KOH/g: 0.01
Rams. car., wt %: 0.1
Kin. vis., cst @ 68° F.: 1.44
@ 100° F.: 0.96
V/Ni/Fe, ppm: 0/0/0

Gasoline
Range, °F.: C_5 - 200
Yield, vol %: 21.9
Gravity, °API: 72.8
Sulfur, wt %: 0.024
Rvp, psi: 10.7
Charac. factor 12.16
P/N/A, vol %: 78.4/14.4/7.2
RONC: 73.7
MONC: 72.3

Naphtha
Range, °F.: 200-320
Yield, vol %: 22.3
Gravity, °API: 50.9
Sulfur, wt %: 0.008
Rvp, psi: 1.2
Charac. factor: 11.51
P/N/A, vol %: 55.9/21.5/22.6
RONC: 61.6
MONC: 60.0

Heavy naphtha
Range, °F.: 320-400
Yield, vol %: 11.6
Gravity, °API: 46.8
Sulfur, wt %: 0.006
Charac. factor: 11.76
Aromatics, vol %: 27.2
Aniline pt., °F.: 124.9
Diesel index: 58.4
Cetane index: 36.9
Freeze pt., °F.: −74
Smoke pt., mm: 22

Kerosine
Range, °F.: 320-520
Yield, vol %: 25.8
Gravity, °API: 42.2
Sulfur, wt %: 0.032
Rvp, psi: 11.69
Aromatics, vol %: 33.4
Aniline pt., °F.: 137.5
Diesel index: 58.0
Cetane index: 40.3
Freeze pt., °F.: −53
Cloud pt., °F.: −64
Pour pt., °F.: −67
Smoke pt., mm: 20
Nuet. no., mg KOH/g: 0.03
Vis., SUS @ 68° F.: 31.8

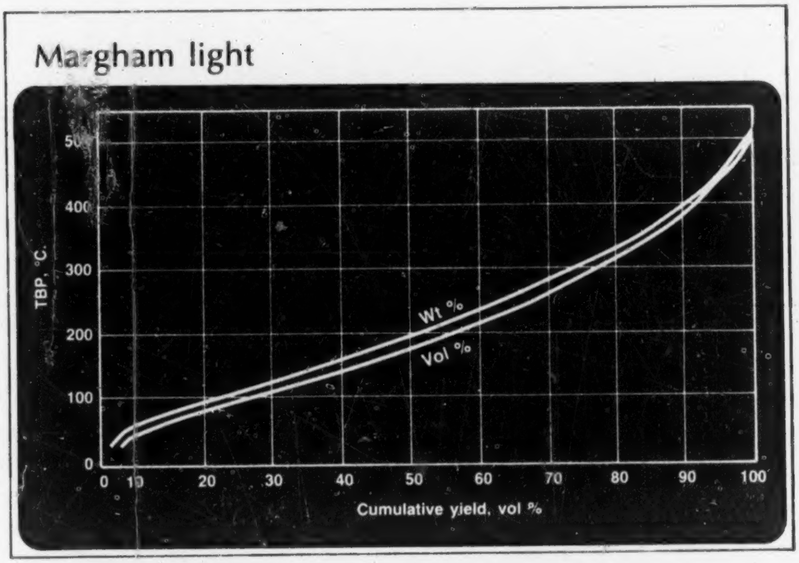
Diesel
Range, °F.: 520-650
Yield, vol %: 10.9
Gravity, °API: 33.8
Sulfur, wt %: 0.266
Charac. factor: 11.75
Aniline pt., °F.: 166.4
Diesel index: 56.2
Cetane index: 49.5
Cloud pt., °F.: 24
Pour pt., °F.: 21
Nitrogen, wt %: 0.006
Nuet. no., mg KOH/g: 0.05
Vis., SUS @ 68° F.: 44.8
@ 122° F.: 36.3

Gas oil
Range, °F.: 650-850
Yield, vol %: 9.1
Gravity, °API: 29.7
Sulfur, wt %: 0.392
Charac. factor: 11.95
Pour pt., °F.: 80
Nitrogen, wt %: 0.030
Nuet. no., mg KOH/g: 0.09
Rams. Car., wt %: 0.01
Vis., SUS @ 122° F.: 58.9
@ 210° F.: 38.0

Residuum
Range, °F.: 650+
Yield, vol %: 13.3
Gravity, °API: 27.8
Sulfur, wt %: 0.413
Pour pt., °F.: 89
Nitrogen, wt %: 0.046
Rams. car., wt %: 0.52
Vis., SUS @ 122° F.: 75.2
@ 210° F.: 42.8
V/Fe ppm: 1/1

Residuum
Range, °F.: 850+
Yield, vol %: 4.2
Gravity, °API: 23.8
Sulfur, wt %: 0.457
Pour pt., °F.: 122

Condensate and Margham Light, are assayed



Nitrogen, wt %: 0.079
Rams. car., wt %: 1.57
Vis., SUS @ 122° F.: 281
@ 210° F.: 70.9
V/Fe, ppm: 2/2

Margham Light, Dubai, U.A.E.

Port of Jebal Ali

Crude
Gravity, °API: 50.33
Vis. cSt @ 20° C.: 1.49
Pour pt., °C.: −8
Rvp psi: 9.8
Salt, mg/l: 4
Water, wt %: 0.008
Water, vol %: < 0.01
H_2S, ppm: <5
Neut. no., mg KOH/g: <0.01
Sediment, wt %: <0.01
Sulfur, wt %: 0.04
Wax content, wt %: 4.04
Con. carbon, wt %: 0.03
Ash, wt %: <0.01
Asphaltenes, wt %: 0.05
Calorific value, BTU/lb: 20207
V/Ni/Na, ppm: <0.1/<0.1/0.4

Light naptha
Range, °C.: IBP-75
Yield, vol %: 12.88
Gravity, °API: 81.30
Sulfur, wt %: 0.02
Mercaptan sulfur, ppm: <5
Paraffins, wt %: 81.6

Naphthenes, wt %: 10.9
Aromatics, wt %: 7.5
Olefins, vol.%: 0.6

Naphtha
Range, °C.: 75-165
Yield, vol %: 29.64
Gravity, °API: 53.15
Sulfur, wt %: 0.01
Mercaptan sulfur, ppm: <5
Paraffins, wt %: 45.1
Naphthenes, wt %: 25.0
Aromatics, wt %: 29.9
Olefins, vol %: 1.0

Kerosine
Range, °C.: 165-235
Yield, vol %: 16.89
Gravity, °API: 44.52
Sulfur, wt %: 0.02
Smoke pt., mm: 22
Freeze pt °C.: −53
Aromatics, vol %: 20.4
Flash pt °C.: 61
Copper strip corrosion: 1a
Existent gum, mg/100 ml: 1
Neut. no., mg KOH/g: <0.01

Diesel
Range, °C.: 235-300
Yield, vol %: 13.34
Gravity, °API: 37.22
Sulfur, wt %: 0.02
Cetane index: 51
Pour pt. °C.: −26
Cloud pt. °C.: −23
Cold filter plug pt. °C.: −25
Kin. cSt @ 37.8° C.: 2.79
Kin. cSt @ 50° C.: 2.22
Neut. no., mg KOH/g: <0.01
Con. carbon, 10% bott., wt %: 0.04
Flash pt., °C.: 113

Copper strip corrosion: 1a
Aniline pt. °C.: 70.6
Nitrogen, wt %: <0.01

Diesel
Range, °C.: 300-350
Yield, vol %: 7.25
Gravity, °API: 36.66
Sulfur, wt %: 0.27
Cetane index: 58
Pour pt. °C.: 1
Cloud pt. °C.: 3
Cold filter plug pt. °C.: 1
Kin. cSt @ 37.8° C.: 6.00
Kin. cSt @ 50° C.: 4.40
Neut. no., mg KOH/g: <0.01
Con. carbon, 10% bott., wt %: 0.73
Flash pt., °C.: 159
Copper strip corrosion: 1a
Nitrogen, wt %: <0.01

Gas oil*
Range, °C.: 350-370
Yield, vol %: 2.63
Gravity, °API: 34.18
Sulfur, wt %: 0.25
Cloud pt., °C.: 26
*Insufficient sample for complete analysis of this fraction.

Heavy gas oil
Range, °C.: 350-514.3
Yield, vol %: 13.78
Gravity, °API: 32.04
Sulfur,wt %: 0.18
Kin. cSt @ 37.8° C.: 22.5
@ 50° C.: 14.6
@ 82.2° C.: 6.05
@ 100° C.: 4.26
Pour pt., °C.: 36
Asphaltenes, wt %: <0.05
Con. carbon, wt %: <0.01
V/Ni, mg/kg: <0.1/0.2
Neut. no., mg KOH/g: 0.05
UOP K: 12.40
Nitrogen, wt %: <0.01
Aniline pt., °C.: 103.1
Wax, wt %: 17.2
Ash, wt %: <0.01
Sediment, wt %: <0.01

Residue
Range, °C.: 350+
Yield, vol %: 13.98
Gravity, °API: 31.73
Sulfur, wt %: 0.17
Kin. cSt @ 37.8° C.: 25.2
@ 50° C.: 14.9
@ 82.2° C.: 6.51
@ 100° C.: 4.58
Pour pt., °C.: 32
Asphaltenes, wt %: <0.05
Con. carbon, wt %: 0.04
V/Ni, mg/kg: <0.1/0.9
Neut. no., mg KOH/g: 0.15
Nitrogen, wt %: 0.02
Aniline pt., °C.: 102.4
Wax, wt %: 20.3
Ash, wt %: 0.01
Sediment, wt %: <0.01

AILLEEN CANTRELL
Director of Editorial Surveys
The Oil & Gas Journal

1986 Worldwide Petrochemical Survey

ABU DHABI

RUWAIS FERTILIZER INDUSTRIES

Ruwais. Feed: feedstock gas. Products: ammonia (1,000 mt/d), urea (1,500 mt/d).

ALGERIA

SONATRACH

Arzew. Feed: natural gas. Products: ammonia (1,000 mt/d), aromatics mix (1,152 mt/d), benzene (273 mt/d), ethylene (364 mt/d), formaldehyde (61 mt/d), methanol (303 mt/d), orthoxylene (115 mt/d), ld polyethylene (145 mt/d), polyvinyl chloride (106 mt/d), toluene (5,000 mt/d), urea (400 mt/d), xylene mix (748 mt/d).

ARGENTINA

ATANOR

Baradero, Buenos Aires. Feed: ethyl alcohol. Products: acetaldehyde (5,345 mt/y), acetic acid (7,060 mt/y), acetic anhydride (2,140 mt/y).

Munro, Buenos Aires. Feed: ethyl alcohol, methanol. Products: acetaldehyde (2,405 mt/y), acetic acid (3,210 mt/y), formaldehyde (25,680 mt/y).

Río Tercero, Córdoba. Feed: ethyl alcohol, natural gas. Products: acetaldehyde (3,250 mt/y), acetic acid (4,280 mt/y), methanol (12,880 mt/y).

CARBOCLOR INDUSTRIAS QUIMICAS

Campana. Feed: C_3 and C_4 refinery cuts. Products: acetone (12,000 mt/y), isopropanol (36,000 mt/y).

CASCO SAIC

Pilar. Feed: methanol, natural gas. Products: formaldehyde (38,000 mt/y), methanol (20,000 mt/y).

DIRECCION GENERAL DE FABRICACIONES MILITARES

Campana. Feed: hydrocarbon fractions. Product: aromatics (27,000 mt/y).

Rio Tercero, Cordoba. Feed: natural gas. Product: ammonia (12,000 mt/y).

DUPERIAL SAIC

(subsidiary of Imperial Chemical Industries)

San Lorenzo. Feed: sulfur, natural gas, naphtha, orthoxylene, ethylene, phthalic anhydride, alcohols. Products: carbon disulfide (14,000 mt/y), ethylene (15,000 mt/y), phthalic anhydride (12,400 mt/y), ld polyethylene (20,000 mt/y), plasticizers (18,000 mt/y), propylene-butadiene (6,000 mt/y).

ELECTROCLOR SAIC

Capitán Bermúdez, Santa Fe. Feed: calcium carbide, chlorine, hydrogen. Products: acetylene (15,000 mt/d), ammonia (3,000 mt/y), polyvinyl chloride (32,000 mt/y), vinyl chloride (33,500 mt/y).

IPAKO-Industrias Petroquimicas Argentinas

(owned by private Argentine interests).

Ensenada. Feed: refinery gases. Products: ethylene (15,000 mt/y), ld polyethylene (14,000 mt/y).

MALEIC SA

Ensenada, Buenos Aires. Feed: n-butane. Product: maleic anhydride (7,200 mt/y).

MONSANTO ARGENTINA SAIC

Zarate. Feed: styrene. Products: ABS-polystyrene (24,000 mt/y).

PASA PETROQUIMICA ARGENTINA

(owned by Amcorp SA, Anglo American Corp., Argentina Holdings Ltd., Uniroyal Chemical CI, Vista Chemical Co.)

Pto. Gral. San Martin, Santa Fe. Feed: butane, naphtha, propane. Products: aromatics (180,000 mt/y), butadiene (33,000 mt/y), ethylbenzene (65,000 mt/y), ethylene (23,000 mt/y), styrene (54,000 mt/y), SBR (50,000 mt/y).

PETROQUIMICA BAHÍA BLANCA SAIC

Bahía Blanca. Feed: ethane. Products: ethylene (200,000 mt/y), butadiene (10,000 mt/y), propylene (1,000 mt/y).

PETROQUIMICA GENERAL MOSCONI

Ensenada, Buenos Aires. Feed: naphtha. Products: benzene (84,000 mt/y), cyclohexane (42,000 mt/y), orthoxylene (23,000 mt/y), paraxylene (35,000 mt/y), toluene (33,000 mt/y), xylene mix (9,000 mt/y).

PETROSUR SAIC

Campana. Feed: natural gas. Products: ammonia (210 mt/d), urea (300 mt/d).

POLISUR

Bahía Blanca. Feed: ethylene. Product: ld polyethylene (190,000 mt/y).

SUDAMTEX SA

Azul, Buenos Aires. Feed: dimethyl terephthalate, ethylene glycol. Products: methanol (1,650 mt/y), polyester (5,000 mt/y).

AUSTRALIA

AFL HOLDINGS LTD.

Gibson Island, Queensland. Feed: natural gas. Products: ammonia (240,000 mt/y), urea (245,000 mt/y).

Newcastle, NSW. Feed: natural gas. Product: ammonia (205,000 mt/y).

ALTONA PETROCHEMICAL CL

(50% Esso Australia Ltd., 50% Mobil Oil Australia).

Altona, Vic. Feed: gas oil, ethane. Products: butadiene (17,000 mt/y), ethylene (170,000 mt/y), propylene (50,000 mt/y).

AMPOL REFINERIES LTD.

Lytton, Brisbane. Feed. kerosine, naphtha, reformate. Product: solvents (11,600 mt/y).

AUSTRALIAN CARBON BLACK PL

(100% Cabot Corp.)

Altona, Vic. Feed: petroleum residual. Product: carbon black (58,000 mt/y).

AUSTRALIAN SYNTHETIC RUBBER CL

(35% Esso Australia Ltd., 35% Mobil Oil Australia Ltd., 30% Goodyear Tire & Rubber CL).

Altona. Feed: butadiene, styrene. Products: polybutadiene (10,000 mt/y), SBR (35,000 mt/y).

BORDEN AUSTRALIA PL

Brisbane, Gibson Island. Feed: methanol. Products: formaldehyde (23,000 mt/y), resins.

Melbourne. Feed: methanol. Products: formaldehyde (23,000 mt/y), resins.

COMPOL LTD.

(50% Mobil, 50% Exxon).

Altona, Vic. Feed: ethylene. Products: ld polyethylene (55,000 mt/y), hd polyethylene (55,000 mt/y).

CONTINENTAL CARBON AUSTRALIA PL

(49% affiliate of Witco Corp.—Concarb Div.)

Kurnell, NSW. Feed: heavy aromatic oil, coal tar distillate. Product: carbon black (20,000 mt/y).

CSR CHEMICALS LTD.

Rhodes, Lane Cove, Mayfield. Feed: ethylene, natural gas, heptene, naphthalene, propylene. Products: acetaldehyde (15,000 mt/y), acetic acid (18,500 mt/y), acetic anhydride (3,000 mt/y), butanols (9,500 mt/y), iso-octanol (14,000 mt/y), phthalic anhydride (21,500 mt/y), vinyl acetate (13,000 mt/y), solvents (9,500 mt/y), plasticizers (32,500 mt/y).

HOECHST AUSTRALIA LTD.

(owned 95% by Farbwerke Hoechst AG).

Altona. Feed: olefins. Products: hd polyethylene (56,000 mt/y), polypropylene (35,000 mt/y).

ICI AUSTRALIA LTD.

Botany, NSW. Feed: LPG, light naphtha. Products: butadiene (23,000 mt/y), butylenes (23,000 mt/y), ethylene (250,000 mt/y), ethylene oxide (30,000 mt/y), ld polyethylene (90,000 mt/y), polypropylene (55,000 mt/y), propylene (95,000 mt/y), polyvinyl chloride (56,000 mt/y), vinyl chloride (60,000 mt/y).

Laverton, Vic. Feed: vinyl chloride. Product: polyvinyl chloride (50,000 mt/y).

KWINANA NITROGEN CPL

Kwinana. Feed: refinery offgases. Product: ammonia (305 mt/d).

MONSANTO AUSTRALIA LTD.

West Footscray. Feed: benzene, ethane, propylene. Products: acetone, ethylene, phenol, polyester, polystyrene, styrene, ABS, SBR.

SHELL CHEMICAL (AUSTRALIA) PL

Clyde, N.S.W. Feed: refinery gases. Products: propylene, polypropylene (34,000 mt/y).

Geelong, Victoria. Feed: naphtha, gasoline, refinery gases. Products: alkylbenzene, hydrocarbon solvents and aromatics (50,000 mt/y), polypropylene (60,000 mt/y), propylene.

AUSTRIA

CHEMIE LINZ AG

Enns. Feed: propylene. Product: acrylonitrile (75,000 mt/y).

Linz. Feed: natural gas, naphtha, benzene, orthoxylene. Products: ammonia (500,000 mt/y), maleic anhydride (19,000 mt/y), melamine (35,000 mt/y), oxoalcohols (65,000 mt/y), phthalic anhydride (37,000 mt/y), urea (400,000 mt/y), plasticizers (35,000 mt/y).

HALVIC KUNSTOFFWERKE GmbH

Hallein. Feed: vinyl chloride monomer. Product: polyvinyl chloride.

ÖMV AG

Schwechat. Feed: butane, gasoil, naphtha. Products: butadiene (50,000 mt/y), ethylene (285,000 mt/y), propylene (150,000 mt/y).

PETROCHEMIE DANUBIA GmbH

(100% OMV AG)

Schwechat. Feed: ethylene, propylene. Product: phthalic anhydride (35,000 mt/y), polyethylene (300,000 mt/y), polypropylene (200,000 mt/y).

VIANOVA KUNSTHARZ AG
Werndorf. Feed: alcohols, acids, oils. Products: acrylics and alkyds, unsaturated polyesters, water soluble resins (45,000 mt/y).

BANGLADESH

ZIA FERTILIZER CL
(Bangladesh Chemical Industries Corp.)
Ashuganj. Feed: natural gas. Products: ammonia (930 mt/d), urea (1,600 mt/d).

BELGIUM

AMOCO CHEMICALS BELGIUM NV
(wholly owned by Standard Oil Co. of Indiana).
Geel. Feed: metaxylene, methanol, paraxylene, propylene. Products: dimethyl terephthalate (66,000 mt/y), isophthalic acid (36,000 mt/y), polypropylene (160,000 mt/y), terephthalic acid (90,000 mt/y).

ASED-MARLY NV
Brussels. Feed: natural gas. Product: ammonia (146,000 mt/y).

ASED NV
Willebroek. Feed: natural gas. Product: ammonia (132,000 mt/y).

BASF ANTWERPEN NV
Antwerp. Feed: ethylene, benzene, cyclohexane, vinyl chloride. Products: caprolactam (150,000 mt/y), ethylene glycol (160,000 mt/y), ethylene oxide (150,000 mt/y), polystyrene (145,000 mt/y), polyvinyl chloride (80,000 mt/y), vinyl chloride (160,000 mt/y).

BAYER ANTWERPEN NV
Antwerp. Feed: cyclohexane. Products: caprolactam (110,000 mt/y), polyamid 6 (10,000 mt/y).

BP CHEMICALS BELGIUM
Antwerp. Products: glycols (130,000 mt/y), ethylene oxide (113,000 mt/y), ld polyethylene (135,000 mt/y), esters-ethers (75,000 mt/y).

DOW CHEMICAL
Tessenderlo. Products: polystyrene, hd polyethylene.

DSM
Limburgse Vinyl Mij
Tessenderlo. Feed: ethylene, C12 HCl. Product: vinyl chloride (450,000 mt/y).

ESSOCHEM BELGIUM
Antwerp. Products: aromatics, benzene, butadiene, butylenes, carbon black, cyclohexane, ethylene, isoprene, orthoxylene, paraxylene, hd-ld-lld polyethylene, propylene, toluene, plasticizers, resins, rubber, solvents.

HIMONT BELGIUM NV
Beringen. Feed: propylene. Product: polypropylene (120,000 mt/y).

MONTEFINA
(50% Himont Italia, 50% Petrofina)
Feluy. Feed: propylene, styrene. Products: polypropylene (240,000 mt/y), polystyrene (70,000 mt/y), expandable polystyrene (30,000 mt/y).,

PHILLIPS PETROLEUM CHEMICALS
Tessenderlo. Feed: olefins. Product: petrosulfur compounds (13,000 mt/y).

POLYSAR BELGIUM NV
Antwerp. Feed: isobutylene. Products: butyl rubber (85,000 mt/y).

SOCIETE CARBOCHIMIQUE
Tertre. Feed: natural gas, propylene oxide. Products: ammonia (330,000 mt/y), polyethers (36,000 mt/y), urea (190,000 mt/y).

SOLVIC SA
Jemeppe-sur-Sambre. Feed: ethylene. Products: vinyl chloride, polyvinyl chloride.

UCB-FTAL
Ostend and Schoonaarde. Feed: alcohols, cyclohexanol, orthoxylene, phenol. Products: maleic anhydride (3,000 mt/y), phthalic anhydride (80,000 mt/y), phthalates (73,000 mt/y).

BOLIVIA

YPFB
La Paz. Feed: ethane, propane. Products: ammonia (230,000 mt/y), benzene (170,000 mt/y), ethylene (230,000 mt/y), phenol (20,000 mt/y), ld polyethylene (10,000 mt/y), hd polyethylene (10,000 mt/y), polypropylene (50,000 mt/y), propylene glycol (56,000 mt/y), styrene (70,000 mt/y), urea (370,000 mt/y).

BRAZIL

ALBA AMAZÔNIA SA
Manaus. Feed: methanol. Product: formaldehyde (30,000 mt/y).

ALBA NORDESTE SA
Abreu e Lima. Feed: methanol. Product: formaldehyde (8,000 mt/y).

ALBA QUÍMICA SA
Cotia, S.P. Feed: ethanol, methanol. Products: acetaldehyde (7,200 mt/y), formaldehyde (25,200 mt/y).
Cubatão. Feed: methanol, naphtha. Products: formaldehyde (45,400 mt/y), methanol (33,600 mt/y).
Curitiba, P.R. Feed: methanol. Products: formaldehyde (45,400 mt/y).
Serra. Feed: methanol. Product: formaldehyde (29,700 mt/y).

BANN QUÍMICA SA
Ermelino Matarazzo, SP. Feed: aniline. Product: rubber chemicals (12,800 mt/y).
Paulinia, SP. Feed: benzene, naphtha. Product: aniline (6,000 mt/y).

CAPUAVA CARBONOS INDUSTRIAIS SA
Mauá, São Paulo. Feed: ethylene tar. Product: carbon black (41,200 mt/y).

CIA. DE CARBONOS COLOIDAIS
Candeias, Bahía. Feed: heavy aromatic hydrocarbons. Product: carbon black (56,000 mt/y).

CIQUINE—Cia. Indústrias Químicas do Nordeste
Camaçari, Bahía. Feed: benzene, orthoxylene, phthalic anhydride, 2-ethyl hexanol, propylene. Products: maleic anhydride (6,400 mt/y), phthalic anhydride (28,000 mt/y), plasticizers (10,000 mt/y), propylene (38,800 mt/y).

COMPANHIA BRASILEIRA DE ESTIRENO
Cubatão, S.P. Feed: benzene, ethanol, ethylene. Products: ethylene (4,800 mt/y), ethylbenzene (93,000 mt/y), ethylchloride (500 mt/y), styrene (80,000 mt/y), toluene (3,200 mt/y).

CONSÓRCIO PAULISTA DE MONÓMERO SA
Santo André. Feed: ethylene. Product: vinyl chloride (120,000 mt/y).

COPEBRÁS
Cubatão. Feed: heavy aromatic hydrocarbons. Product: furnace carbon black (120,000 mt/y).

COPENE
Camaçari, Bahía. Feed: gas oil, naphtha, natural gas. Products: aromatics (163,000), benzene (172,170 mt/y), butadiene (55,300 mt/y), butylenes (55,600 mt/y), ethylene (460,000 mt/y), orthoxylene (49,000 mt/y), MTBE (60,000 mt/y), paraxylene (86,000 mt/y), propylene (243,450 mt/y), solvent (22,850 mt/y), toluene (66,090 mt/y), xylene mix (30,190 mt/y).

COPENOR
Camaçari. Feed: methanol. Product: formaldehyde (43,000 mt/y).

COPERBO
Cabo, Pernambuco. Feed: alcohol, butadiene, styrene. Products: acetaldehyde (48,000 mt/y), ethylene (32,000 mt/y), polybutadiene (53,000 mt/y), SBR (23,000 mt/y).

COPESUL
Triunfo, RGS. Feed: naphtha. Products: benzene (114,370 mt/y), butadiene (66,027 mt/y), ethylene (420,000 mt/y), propylene (227,248 mt/y), toluene (19,859 mt/y), xylene mix (41,667 mt/y).

ESTIRENO DO NORDESTE SA
Camaçari, Bahia. Feed: benzene, ethylene. Products: ethylbenzene (170,000 mt/y), polystyrene (55,000 mt/y), styrene (120,000 mt/y), toluene (5,400 mt/y).

FISIBA
Camaçari, Bahia. Feed: acrylonitrile. Product: acrylics (13,200 mt/y).

HERCULES INC.
Triunfo. Feed: propylene. Product: polypropylene (50,000 mt/y).

INDÚSTRIAS QUÍMICAS ELETRO CLORO SA
Elclor. Feed: ethylene, vinyl chloride. Products: ethylene (10,500 mt/y), hd polyethylene (82,000 mt/y), polyvinyl chloride (100,000 mt/y), vinyl chloride (34,000 mt/y).

METANOR SA—Metanol do Nordeste
Camaçari, Bahia. Feed: carbon dioxide, natural gas. Product: methanol (70,400 mt/y).

NITRIFLEX SA
Duque de Caxias, Rio de Janeiro. Feed: acrylonitrile, butadiene, styrene. Products: ABS-MBS (18,000 mt/y), resins, rubber (17,000 mt/y).

NITROCARBONO SA
Camaçari. Feed: ammonia, benzene. Products: caprolactam (45,000 mt/y), cyclohexane (48,000 mt/y), polyamide 6 (1,300 mt/y).

NITROFÉRTIL
Camaçari, Bahía. Feed: natural gas. Products: ammonia (1,107 mt/d), urea (1,050 mt/d).
Laranjeiras, Sergipe. Feed: natural gas. Products: ammonia (907 mt/d), urea (1,100 mt/d).

OXITENO SA INDÚSTRIA E COMÉRCIO
Camaçari, Bahía. Feed: ethylene, oxygen. Products: ethylene glycol (122,130 mt/y), ethylene oxide (105,000 mt/y).
Mauá, São Paulo. Feed: ethylene, oxygen. Products: ethylene glycol (25,000 mt/y), ethylene oxide (35,000 mt/y).

PETROFLEX
Duque de Caxias. Feed: butadiene, ethylbenzene, styrene. Products: butadiene (45,000 mt/y), styrene (60,000 mt/y), SBR (185,000 mt/y).
Triunfo. Feed: benzene, butadiene, ethylene, styrene. Products: ethylbenzene (140,000 mt/y), SBR (40,000 mt/y).

PETROQUÍMICA UNIÃO SA
Santo André, Capuava. Feed: naphtha. Products: alkybenzene (11,500 mt/y), benzene (170,000 mt/y), butadiene (50,000 mt/y), butylenes (59,400 mt/y), carbon black feedstock (51,000 mt/y), ethylene (360,000 mt/y), orthoxylene (35,000 mt/y), propylene (204,000 mt/y), resins (10,000 mt/y), toluene (40,000 mt/y), xylene mix (55,000 mt/y).

POLIALDEN PETROQUÍMICA SA
Camaçari, Bahía. Feed: ethylene. Product: hd polyethylene (80,000 mt/y).

POLIBRASIL
Mauá, São Paulo. Feed: propylene. Product: polypropylene (90,000 mt/y).

POLIOLEFINAS SA

Capuava, Santo André. Feed: ethylene, vinyl acetate. Product: ethylene-vinyl acetate copolymer and ld polyethylene (110,000 mt/y).

Triunfo, Rio Grande do Sul. Feed: ethylene. Product: ld polyethylene (160,000 mt/y).

POLIPROPILENO SA

Camaçari, Bahía. Feed: propylene. Product: polypropylene (72,000 mt/y).

POLISUL PETROQUIMICA SA
(40% Hoechst AG)

Triunfo. Feed: ethylene. Product: hd polyethylene (80,000 mt/y).

POLITENO

Camaçari, Bahía. Feed: ethylene. Product: ld polyethylene (130,000 mt/y).

PRONOR PETROQUÍMICA SA

Camaçari. Feed: methanol, paraxylene, toluene. Products: dimethyl terephthalate (70,000 mt/y), toluene diisocyanate (30,000 mt/y).

RHÓDIA SA

Paulínia. Feed: alcohol, cumene, paraxylene. Products: acetaldehyde (58,500 mt/y), acetic acid (70,600 mt/y), acetone (62,420 mt/y), bisphenol A (15,000 mt/y), butanol (6,000 mt/y), cyclohexane (400 mt/y), isopropanol (7,700 mt/y), phenol (102,000 mt/y), polyester (42,000 mt/y), terephthalic acid (90,000), vinyl acetate (29,000 mt/y).

Santo André. Feed: alcohol. Product: acetic anhydride (26,000 mt/y).

SALGEMA SA

Maceió, Alagoas. Feed: ethylene, chlorine. Product: ethylene (100,000 mt/y), ethylene dichloride (300,000 mt/y).

ULTRAFÉRTIL SA

Araucária. Feed: anhydrous ammonia, asphaltic residue, syngas. Product: ammonia (396,000 mt/y), methanol (7,920 mt/y), urea (495,000 mt/y).

Cubatão. Feed: refinery off gases. Product: ammonia (30,000 mt/y).

Plaçaguera. Feed: naphtha, refinery off gases. Product: ammonia (149,820 mt/y).

UNION CARBIDE DO BRASIL LTDA.

Cubatão, São Paulo. Feed: ethylene. Products: ethanol (92,000 mt/y), ethylene (40,000 mt/y), ld polyethylene (128,000 mt/y).

USIMINAS SA
(Usinas Siderúrgicas de Minas Gerais)

Ipatinga. Feed: coke oven gas, coal tar. Products: ammonia (17 t/d), benzene (45 t/d), naphthalene (22 t/d), toluene (9 t/d), xylene mix (2 t/d).

CANADA

ALBERTA GAS CHEMICALS LTD.
(50% Nova, 50% Carma Developers Ltd.)

Medicine Hat, Alberta. Feed: natural gas. Product: methanol (2,400 mt/d).

ALBERTA GAS ETHYLENE CL

Joffre, Alberta. Feed: ethane. Products: butadiene (51,000 mt/y), ethylene (1,224,000 mt/y), propylene (35,000 mt/y).

BASF CANADA INC.

Cornwall, Ontario. Feed: orthoxylene. Products: phthalic anhydride (40,000 mt/y), plasticizers (25,000 mt/y).

Laval, Que. Feed: styrene. Product: expandable polystyrene (16,000 mt/y).

BORDEN CHEMICAL CANADA

Laval, Quebec. Feed: methanol. Product: formaldehyde (25,000 mt/y).

Edmonton, Alberta. Feed: methanol. Product: formaldehyde (35,000 mt/y).

BORG-WARNER (CANADA) LTD.

Coburg, Ont. Product: ABS (20,000 mt/y).

CABOT CANADA LTD.

Sarnia, Ont. Feed: heavy fuel oil. Product: carbon black (80,000 mt/y).

CANADIAN FERTILIZERS LTD.

Medicine Hat, Alta. Feed: natural gas. Product: ammonia (800,000 mt/y), urea (545,000 mt/y).

CANCARB LTD.

Medicine Hat, Alta. Feed: natural gas. Product: carbon black (30,000 mt/y).

CELANESE CANADA LTD.

Clover Bar (near Edmonton). Feed: butanes, ethylene, natural gas. Products: acetaldehyde (1,700 mt/y), acetic acid (72,000 mt/y), acetic anhydride (27,000 mt/y), acetone (1,700 mt/y), formaldehyde (38,000 mt/y), methanol (750,000 mt/y), vinyl acetate (52,000 mt/y).

C-I-L INC.

Courtright, Ont. Feed: natural gas. Product: ammonia (720,000 mt/y), urea (140,000 mt/y).

Edmonton, Alta. Feed: ethylene. Product: ld polyethylene (70,000 mt/y).

COLUMBIAN CHEMICALS CO.

Hamilton, Ont. Feed: heavy aromatic hydrocarbons. Product: furnace carbon black (70,000 mt/y).

COMINCO LTD.

Calgary, Alta. Feed: natural gas. Product: ammonia (110,000 mt/y).

Carseland, Alta. Feed: natural gas. Product: ammonia (410,000 mt/y), urea (480,000 mt/y).

Trail, B.C. Feed: natural gas. Product: ammonia (66,000 mt/y).

COMMERCIAL ALCOHOLS LTD.

Varennes, Que. Feed: ethylene. Product: ethanol (55,000 mt/y).

CYANAMID CANADA INC.

Niagara Falls, Ont. Feed: natural gas. Products: ammonia (220,000 mt/y), urea (91,000 mt/y).

DOW CHEMICAL OF CANADA INC.

Fort Saskatchewan, Alta. Feed: ammonia, brine, caustic, chlorine, ethylene. Products: ethanolamines, ethylene dichloride, ethylene glycol, ethylene oxide, lld polyethylene, vinyl chloride.

Sarnia, Ont. Feed: benzene, butadiene, chlorine, ethylene, propylene. Products: ethylbenzene, ethylene dichloride, ld and hd polyethylene, polystyrene, propylene glycol, propylene oxide, styrene, vinyl chloride, SBR.

Varennes, Que. Feed: butadiene, styrene. Product: SBR.

DU PONT CANADA INC.

Corunna, Ont. Feed: ethylene. Product: ld & hd polyethylene (235,000 mt/y).

ESSO CHEMICAL CANADA
(Division of Imperial Oil)

Ioco, B.C. Feed: naphtha. Product: toluene (7,000 mt/y).

Redwater, Alberta. Feed: natural gas. Products: ammonia (825,000 mt/y), urea (525,000 mt/y).

Sarnia, Ontario. Feed: natural gas liquids. Products: benzene (100,000 mt/y), butadiene (8,000 mt/y), butylenes (4,000 mt/y), carbon black (65,005 mt/y), ethylene (220,000 mt/y), polyethylene (135,000 mt/y), polyvinyl chloride (90,000 mt/y), propylene (40,000 mt/y), toluene-xylene (140,000 mt/y).

ETHYL CANADA INC.

Corunna, Ont. Feed: ethylene. Products: ethyl chloride (36,000 mt/y), ethylene dichloride (12,000 mt/y).

B.F. GOODRICH CANADA INC.

Niagara Falls, Ont. Product: polyvinyl chloride resins (110,000 t/y).

Shawinigan, Quebec. Product: polyvinyl chloride resins (55,000 t/y).

HIMONT CANADA INC.

Varennes, Quebec. Feed: propylene. Product: polypropylene (70,000 mt/y).

NITROCHEM INC.

Maitland, Ontario. Feed: natural gas. Products: ammonia (80,000 mt/y).

NOVACOR CHEMICALS LTD.

Joffre, Alberta. Feed: ethylene. Product: ld polyethylene (270,000 mt/y).

OCELOT INDUSTRIES LTD.

Kitimat, B.C. Feed: natural gas. Product: methanol (1,200 mt/d).

PETRO-CANADA PRODUCTS

Pointe-Aux-Trembles. Feed: crude oil. Products: aromatics (150,000 mt/y), benzene (150,000 mt/y), orthoxylene (25,000 mt/y), normal paraffins (25,000 mt/y), polyisobutylene (11,000 mt/y), toluene (150,000 mt/y), xylene mix (150,000 mt/y).

POLYSAR LTD.

Cambridge, Ont. Feed: styrene. Product: polystyrene (37,000 mt/y).

Corunna, Ont. Feed: heavy atm. gas oil from crude and condensate, naphtha. Products: aromatics mix (125,000 mt/y), benzene (140,000 mt/y), butadiene (90,000 mt/y), butylenes (130,000 mt/y), ethylene (455,000 mt/y), propylene (330,000 mt/y).

Montreal. Feed: styrene. Product: polystyrene (38,000 mt/y).

Sarnia, Ont. Feed: acrylonitrile, benzene, C_4 streams, ethylene, ethylbenzene, light oil. Products: styrene (270,000 mt/y), SBR-NBR-BR-IIR (262,000 mt/y), toluene (13,000 mt/y).

RECOCHEM INC.

Napierville, Que. Products: benzene (20,000 mt/y), naphthalene (25,000 mt/y), toluene, xylene.

REICHHOLD LTD.

North Bay, Ont. Feed: methanol. Product: formaldehyde (100,000 mt/y).

Port Moody, B.C. Feed: methanol. Product: formaldehyde (15,500 mt/y).

Ste. Therese, Que. Feed: methanol. Product: formaldehyde (15,500 mt/y).

Thunder Bay, Ont. Feed: methanol. Products: formaldehyde (55,000 mt/y).

SHELL CANADA LTD.

Corunna, Ont. Feed: reformate, propylene. Products: benzene (65,000 mt/y), isopropanol (91,000 mt/y), polypropylene (70,000 mt/y), toluene (60,000 mt/y), xylene mix (60,000 mt/y).

Montreal East, Que. Feed: isopropyl alcohol. Product: acetone, C_6, chemical solvents (27,000 mt/y).

Scotford, Alta. Feed: benzene, ethylene. Product: styrene (300,000 mt/y).

SHERRITT GORDON MINES LTD.

Fort Saskatchewan, Alta. Feed: natural gas. Products: ammonia (490,000 mt/y), urea (393,000 mt/y).

SIMPLOT CHEMICAL CL

Brandon, Man. Feed: natural gas. Products: ammonia (550 mt/d), urea (480 mt/d).

SUNOCO INC.

Sarnia. Feed: reformate. Products: benzene (48,000 mt/y), orthoxylene (37,000 mt/y), toluene (180,000 mt/y), xylene mix (140,000 mt/y).

UNION CARBIDE CANADA LTD.

Montreal East, Que. Feed: ethylene. Products: ethylene glycol (82,000 mt/y), ethylene oxide (80,000 m/ty).

Red Deer, Alta. Product: ethylene glycol (250 mt/d).

Sarnia, Ont. Feed: polyethylene. Products: ld-hd polyethylene (215,000 mt/y).

WESTERN CO-OPERATIVE FERTILIZERS LTD.

Calgary, Alta. Feed: natural gas. Products: ammonia (200 mt/d).

Medicine Hat, Alta. Feed: natural gas. Product: ammonia (180 mt/d).

CHILE

PETROX SA

Talcahuano. Feed: naphtha. Product: ethylene (60,000 mt/y).

CHINA, TAIWAN

CHANG CHUN PETROCHEMICAL CL

Miaoli. Feed: acetic acid, n-isobutanol. Products: acetic acid (36,000 mt/y), acrylics (4,000 mt/y), n-isobutyl acetate (24,000 mt/y), formaldehyde (25,000 mt/y), polyvinyl alcohol (36,000 mt/y).

CHANG CHUN PLASTICS CL

Kaohsiung. Products: formaldehyde (33,000 mt/y), polyacrylamide (10,000 mt/y), polyester (2,500 mt/y), resins (7,200 mt/y).

Shin-Tsu. Feed: methanol. Product: formaldehyde (50,000 mt/y), resins (61,500 mt/y).

CHINA AMERICAN PETROCHEMICAL CL

Lin Yuan. Feed: PTA. Product: terephthalic acid (430,000 mt/y).

CHINA PETROCHEMICAL DEVELOPMENT CORP.

Kaohsiung. Feed: cyclohexane. Products: caprolactam (50,000 mt/y).

Ta-She. Feed: ammonia, propylene, syngas. Product: acetic acid (60,000 mt/y), acrylonitrile (132,000 mt/y), methanol (66,000 mt/y).

Toufen. Feed: benzene, ethane. Product: caprolactam (50,000 mt/y), ethylene, (54,000 mt/y).

CHINA SYNTHETIC RUBBER CORP.
(Licensee of Witco Corp.—Concarb Div.)

Kaohsiung. Feed: indigenous E.B. Product: carbon black (45,000 mt/y).

CHINESE PETROLEUM CORP.

Kaohsiung. Feed: gas oil, naphtha. Products: benzene (194,000 mt/y), butadiene (128,000 mt/y), cyclohexane (60,000 mt/y), ethylene (899,000 mt/y), orthoxylene (60,000 mt/y), paraxylene (200,000 mt/y), propylene (469,000 mt/y).

CHIUNGLONG PETROCHEMICAL CL

Kaohsiung. Products: polypropylene glycol (15,000 mt/y), propylene glycol (5,600 mt/y), propylene oxide (15,000 mt/y).

DAIREN CHEMICAL CORP.

Kaohsiung. Feed: acetic acid, ethylene. Product: ethyl acetate (30,000 mt/y), vinyl acetate (100,000 mt/y).

FORMOSA PLASTICS CORP.

Kaohsiung. Products: acrylics (80,000 mt/y), hd polyethylene (120,000 mt/y), polyvinyl chloride (538,000 mt/y), vinyl chloride (480,000 mt/y).

FORMOSAN UNION CHEMICAL CORP.

Lin Yuan. Feed: benzene, n-olefin, propylene tetramer. Product: alkylbenzene (50,000 mt/y).

GRAND PACIFIC PETROCHEMICAL CORP.

Ta-She, Kaohsiung. Feed: acrylonitrile, benzene, butadiene, ethylene. Products: ABS (200,000 mt/y), styrene (200,000 mt/y).

HO TUNG CHEMICAL CORP.

Jen-Wu, Kaohsiung. Feed: kerosine, light diesel. Product: normal paraffins (30,000 mt/y).

LEE CHANG YUNG CHEMICAL INDUSTRY CORP.

Hsin-Chu. Feed: natural gas. Products: formaldehyde (100,000 mt/y), methanol (65,000 mt/y).

Lin-Yuan. Feed: ethylene, propylene. Products: acetaldehyde (45,000 m/ty), acetone (20,000 mt/y), isopropanol (40,000 mt/y).

ORIENTAL UNION CHEMICAL CORP.

Kaoshiung. Feed: ethylene. Products: ethylene glycol (150,000 mt/y), ethylene oxide (117,000 mt/y).

TAIWAN FERTILIZER CO.

Miaoli. Feed: natural gas. Products: ammonia (306,000 mt/y), urea (199,000 mt/y).

TAIWAN POLYPROPYLENE CL

Kaohsiung. Feed: ethylene, propylene. Product: polypropylene (120,000 mt/y).

TAIWAN SYNTHETIC RUBBER CORP.

Ta-She, Kaohsiung. Feed: butadiene, styrene. Products: polybutadiene (40,000 mt/y), SBR (100,000 mt/y).

USI FAR EAST CORP.

Kaohsiung. Feed: ethylene. Product: hd polyethylene (80,000 mt/y), ld polyethylene (140,000 mt/y).

COLOMBIA

AMONIACO DEL CARIBE SA

Cartagena. Feed: natural gas. Product: ammonia (350 mt/d).

CABOT COLOMBIANA SA
(subsidiary of Cabot Corp., Boston, Mass.)

Mamonal, Cartagena. Feed: aromatic tar, natural gas. Product: carbon black (20,000 mt/y).

CARBOQUIMICA SA.

Bogota. Feed: orthoxylene, oxoalcohols, coal tar. Products: benzene (2,000 mt/y), naphthalene (1,000 mt/y), phthalic anhydride (12,000 mt/y), plasticizers (20,000 mt/y), solvents (3,000 mt/y), terephthalic acid (2,000 mt/y), xylene mix (2,500 mt/y).

CIA. QUIMICA BORDEN SA

Yumbo, Valle. Feed: methanol. Products: formaldehyde (9,200 mt/y).

DOW COLOMBIANA SA

Cartagena. Feed: styrene. Product: polystyrene (27,500 mt/y).

EMPRESA COLOMBIANA DE PETROLEOS

Barrancabermeja. Feed: refinery products. Products: alkylbenzene (15,000 mt/y), benzene (43,000 mt/y), cyclohexane (20,000 mt/y), ethylene (115,000 mt/y), orthoxylene (8,000 mt/y), ld polyethylene (55,000 mt/y), propylene (5,500 mt/y), toluene (20,000 mt/y), xylene mix (36,000 mt/y), solvents (50,000 mt/y).

MONOMEROS COLOMBO VENEZOLANOS SA
(DSM affiliate)

Barranquilla. Feed: cyclohexane. Product: caprolactam (22,000 mt/y).

PETROQUIMICA COLOMBIANA SA

Mamonal, Cartagena. Feed: vinyl chloride. Products: polyvinyl chloride (82,000 mt/y).

POLICOLSA (owned by Ecopetrol)

Barrancabermeja. Feed: natural gas, cracking gases. Products: ethylene (100,000 mt/y), ld polyethylene (55,000 mt/y), propylene (9,000 mt/y).

PRODUCTOS PETROQUIMICOS

Yumbo, Valle. Feed: aromatic tar, coal tar fractions. Product: carbon black (18,000 mt/y).

ECUADOR

CIA. QUIMICA BORDEN EQUATORIANA SA

Quito. Feed: methanol. Products: formaldehyde (9,200 mt/y).

EGYPT

AMERIA PETROLEUM REFINING CO.

Ameria. Feed: naphtha. Products: alkylbenzene (40,000 mt/y), benzene (23,000 mt/y), toluene (4,000 mt/y).

EGYPTIAN PETROCHEMICAL CO.

Ameria. Feed: imported ethylene, sodium chloride. Products: polyvinyl chloride (80,000 mt/y), vinyl chloride (100,000 mt/y).

EL NASR d'ENGRAIS et d'INDUSTRIES CHIMIQUES.

Suez-Attaka. Feed: natural gas. Product: ammonia (250 t/d).

Talkha. Feed: natural gas. Product: ammonia (396 t/d), urea (570,000 mt/y).

FINLAND

KEMIRA OY

Oulu. Feed: heavy fuel oil. Products: ammonia (85,000 mt/y), formic acid (20,000 mt/y), urea (100,000 mt/y).

NESTE OY

Kokemaki. Feed: styrene. Product: polystyrene (10,000 mt/y).

Porvoo. Feed: alcohols, benzene, cumene, ethylene, FCC gas, glycols, naphtha, n-hexane, n-pentane, orthoxylene, phthalic anhydride, propylene, pyrolysis gasoline, reformate, styrene, vacuum gas oil, vinyl chloride. Products: acetone (39,000 mt/y), benzene (115,000 mt/y), butadiene (20,000 mt/y), cumene (70,000 mt/y), ethylene (200,000 mt/y), phthalic anhydride (20,000 mt/y), phenol (65,000 mt/y), plasticizers (10,000 mt/y), polyester (10,000 mt/y), ld polyethylene (175,000 mt/y), polystyrene (20,000 mt/y), polyvinyl chloride (60,000 mt/y), propylene (120,000 mt/y).

FRANCE

ALTULOR
(100% CdF Chimie)

Bernouville. Feed: methylmethacrylate. Product: acrylics (13,000 mt/y).

Saint Avold. Feed: methylmethacrylate. Product: acrylics (4,000 mt/y).

AMMONIAC DE GRAND QUEVILLY
(67% CDF-AZF, 33% Cofaz)

Grand Quevilly (near Rouen). Feed: natural gas. Product: ammonia (1,000 mt/d).

AMMONIAC SARRO-LORRAIN
(52% APC, 27% CSL, 15% Norsolor)

Carling. Feed: natural gas. Product: ammonia (330,000 mt/y).

APC/GESA
(100% CdF Chimie)

Mazingarbe. Feed: coke oven gas, naphtha. Products: ammonia (220,000 mt/y).

Toulouse. Feed: natural gas. Products: ammonia (445,000 mt/y), urea (150,000 mt/y).

ATOCHEM

Balan (Ain). Feed: ethylene, vinyl chloride. Product: ld polyethylene (120,000 mt/y), polyvinyl chloride (130,000 mt/y).

Brignoud (Isère). Feed: vinyl chloride. Products: polyvinyl chloride (100,000 mt/y).

Chauny. Feed: naphthalene, orthoxylene. Product: phthalic anhydride (80,000 mt/y), plasticizers (60,000 mt/y).

Feyzin. Feed: naphtha. Products: aromatics (165,000 mt/y), butadiene (50,000 mt/y), ethylene (200,000 mt/y), propylene (115,000 mt/y).

Gonfreville l'Orcher. Feed: naphtha, LPG. Products: benzene (150,000 mt/y), butadiene (60,000 mt/y), ethylbenzene (280,000 mt/y), ethylene (200,000 mt/y), propylene (190,000 mt/y), styrene (250,000 mt/y).

La Chambre (Savoie). Feed: acetone, ethanol, 2-butanol. Product: solvents (100,000 mt/y).

Lannemezan (Hautes Pyrénées). Product: formaldehyde.

Lavera. Feed: propylene, naphtha, LPG. Products: butadiene (90,000 mt/y), ethylene (480,000 mt/y), propylene (240,000 mt/y), propylene glycol (40,000 mt/y), propylene oxide (65,000 mt/y), vinyl chloride (360,000 mt/y).

Mont (near Lacq). Feed: ammonia, ethylene, vinyl acetate. Product: ld polyethylene with copolymers (75,000 mt/y).

Notre Dame de Gravenchon (Seine Maritime). Feed: n-butenes. Product: 2-butanol (50,000 mt/y).

Saint Auban. Products: polyvinyl chloride (125,000 mt/y), vinyl chloride (120,000), solvents.

Saint Fons, Rhone. Product: polyvinyl chloride (155,000 mt/y).

AZOLACQ
(50% Cofaz, 50% CdF Chimie AZF)

Oissel. Feed: ammonia, carbon dioxide. Product: urea (360 mt/d).

BAYER ELASTOMÈRES
Lillebonne. Feed: butadiene, styrene. Products: polybutadiene (50,000 mt/y), SBR (18,000 mt/y), SBR latex (24,000 mt/y).

BP CHEMICALS LTD.
Wingles. Products: polystyrene (115,000 mt/y), expandable polystyrene (25,000 mt/y).

BP CHIMIE
Lavéra, Martigues. Feed: GPL, naphtha. Products: benzene (85,000 mt/y), butadiene (50,000 mt/y), ethylene (240,000 mt/y), ethylene glycol (165,000 mt/y), ethylene oxide (150,000 mt/y), polyisobutylene (36,000 mt/y), polyethylene (140,000 mt/y), polypropylene (80,000 mt/y), propylene (155,000 mt/y).

CDF CHIMIE AZF
(48% CDF-AZF, 42% Cofaz, 10% Rhone-Poulenc)

Grand Quevilly (near Rouen). Feed: natural gas. Product: ammonia (1,000 mt/d).

CdF CHIMIE EP
Carling. Feed: benzols, crude oil, gazole, naphtha. Products: benzene (330,000 mt/y), cyclohexane (55,000 mt/y), ethylene (440,000 mt/y), ld polyethylene (220,000 mt/y), propylene (220,000 mt/y), styrene (220,000 mt/y).

Harnes (Pas-de-Calais). Products: oxoalcohols (130,000 mt/y).

Lillebonne. Feed: ethylene. Product: lld polyethylene (90,000 mt/y).

Villers Saint Paul (Oise). Feed: natural gas, oxoalcohols, orthoxylene, benzene, styrene. Products: maleic anhydride (14,000 mt/y), phthalic anhydride (15,000 mt/y), polyester (30,000 mt/y), expandable polystyrene (45,000 mt/y), plasticizers (80,000 mt/y).

Villers Saint Sepulcre (Oise). Product: ABS (50,000 mt/y).

CIE. CHIMIQUE DE LA MEDITERRANEE
(joint venture of BASF and Shell group).

Berre l'Etang. Feed: ethylene. Product: ld polyethylene (105,000 mt/y).

CIE. DU POLYISOPRENE SYNTHETIQUE
Oudalle. Feed: C-5's, isoprene. Products: isoprene-azeotrope (45,000 mt/y), polyisoprene (45,000 mt/y).

CIE. FRANCAISE DE RAFFINAGE
Gonfreville l'Orcher. Feed: crude. Products: benzene (70,000 mt/y), propylene oligomers (40,000 mt/y), toluene (7,000 mt/y).

COFAZ
Pardies (Pyrenees Atlantiques). Feed: natural gas. Products: ammonia (400 mt/d).

Soulom (Hautes Pyrenees). Feed: natural gas. Products: ammonia (710 mt/d), urea (300 mt/d).

COPENOR-Compagnie Petrochimique du Nord
(60% CdF Chimie)

Dunkerque. Feed: naphtha, gazole, LPG. Products: ethylene (225,000 mt/y), ld polyethylene (180,000 mt/y), propylene (110,000 mt/y).

ESSO CHIMIE
Notre Dame de Gravenchon. Feed: refinery products. Products: butadiene (70,000 mt/y), ethylene (300,000 mt/y), propylene (220,000 mt/y), solvents (60,000 mt/y).

GROUPE ELF AQUITAINE
(Societe Nationale Elf Aquitaine)

Lacq. Feed: natural gas. Products: benzene (95,000 mt/y), cyclohexane (30,000 mt/y), ethylbenzene (60,000 mt/y), ethylene (110,000 mt/y), styrene (50,000 mt/y), solvents (15,000 mt/y).

HGD—Huiles, Goudrons et Dérivés
(94% CdF Chimie)

Mariénau. Feed: coal tars. Product: naphthalene (15,000 mt/y).

Vendin le Vieil. Feed: coal tars. Product: phthalic anhydride (12,000 mt/y).

ICI LTD.
Balycourt. Product: plasticizers (70,000 mt/y).

METHANOLACQ
Pardies. Feed: residual, natural gas. Product: methanol (120,000 mt/y).

NORSOLOR
(100% CdF Chimie)

Saint Avold. Feed: ammonia, propylene. Products: acrylics (60,000 mt/y), acrylonitrile (90,000 mt/y), acrylates (165,000 mt/y).

ORGANICHIM.
(83% Cdf Chimie group: 69% STS, 14% CdF)

Mazingarbe. Product: formaldehyde (25,000 mt/y).

Premery. Product: formaldehyde (12,000 mt/y).

Villers St. Paul. Product: formaldehyde (50,000 mt/y).

PEC-RHIN
(50% APC, 50% BASF).

Ottmarsheim. Feed: natural gas. Product: ammonia (180,000 mt/y).

PETERLITE
(80% Norsolor)

Clairvaux les Lacs. Product: acrylics (1,100 mt/y).

PETROSYNTHESE SA
(35% Chevron Chemical Co., 35% CFR, 30% Rhone-Poulenc)

Gonfreville. Feed: benzene, propylene. Products: alkylbenzene (100,000 mt/y).

POLYSAR FRANCE SA.
Strasbourg. Feed: acrylonitrile, benzene, butadiene, ethylene. Products: SBR latex, nitrile rubber (160,000 mt/y).

RHONE POULENC
Pardies. Feed: natural gas, methanol. Products: acetic acid (300,000 mt/y), vinyl acetate (150,000 mt/y).

Pont de Claix. Product: bisphenol A (50,000 mt/y).

Roussillon. Feed: acetic acid, benzene, propylene. Products: acetic anhydride (80,000 mt/y), acetone (60,000 mt/y), cumene (150,000 mt/y), phenol (100,000 mt/y).

SHELL CHIMIE
Berre. Products: alkylbenzene (42,000 mt/y), benzene (60,000 mt/y), butadiene (80,000 mt/y), butanol (45,000 mt/y), ethylene (380,000 mt/y), isopropanol (108,000 mt/y), polybutadiene (50,000 mt/y), polypropylene (100,000 mt/y), polystyrene (50,000 mt/y), polyvinyl chloride (145,000 mt/y), propylene (190,000 mt/y), toluene (15,000 mt/y), SBR (85,000 mt/y), TR (30,000 mt/y), xylene mix (8,000 mt/y).

SOCABU-SOCIETE DU CAOUTCHOUC BUTYL
Notre Dame de Gravenchon. Feed: refinery products. Products: butyl rubber (52,000 mt/y), ethylene-propylene rubber (50,000 mt/y).

SOCIÉTÉ ARTESIENNE DE VINYLE
(DSM subsidiary)

Mazingarbe. Product: polyvinyl chloride (160,000 mt/y).

SOCIÉTÉ CHIMIQUE DE DIEUZE
(75% CdF Chimie EP)

Dieuze. Feed: styrene. Product: polystyrene (110,000 mt/y).

Ribecourt. Feed: styrene. Product: polystyrene (55,000 mt/y).

SOCIÉTÉ DES ENGRAIS DE L'ILE DE FRANCE
(50% APC, 50% Grande Paroisse)

Nangis. Feed: natural gas. Product: ammonia (300,000 mt/y).

SOCIÉTÉ DU CHLORURE DE VINYLE DE FOS
(60% Shell Chimie, 40% Atochem)

Fos sur Mer (Bouches du Rhône). Feed: chlorine, ethylene. Product: vinyl chloride (200,000 mt/y).

SOCIÉTÉ FRANCAISE HOECHST
Cuise-LaMotte. Feed: methanol. Product: formaldehyde (12,000 mt/y).

Lillebonne. Feed: ethylene, propylene. Product: acetaldehyde (98,000 mt/y), polypropylene (70,000 mt/y).

SOCIÉTÉ NORMANDE DE L'AZOTE
(56% Cofaz, 44% APC)

Gonfreville. Feed: naphtha, natural gas. Products: ammonia (330,000 mt/y), urea (250,000 mt/y).

SOCIÉTÉ TOULOUSAINE DE SYNTHESE
(75% CdF Chimie, 25% APC)

Toulouse. Feed: methanol, urea. Products: formaldehyde (35,000 mt/y), melamine (12,000 mt/y).

SODES—Société d'Ethanol de Synthèse
(30% Atochem, 45% Rhone Poulenc, 25% SFECI)

Lillebonne. Product: ethanol (100,000 mt/y).

SOLVAY & CIE.
Sarralbe. Feed: ethylene, propylene. Products: hd polyethylene, polypropylene.

Tavaux. Feed: ethylene. Products: polyvinyl chloride, vinyl chloride.

UNITED CHEMICAL FRANCE
Port Jerome. Feed: aromatic oils. Product: carbon black (88,000 mt/y).

USINES LAMBIOTTE
(100% Atochem)

Premery. Product: acetic acid (3,500 mt/y).

GERMANY

AMH CHEMIE
Brunsbuettel. Feed: residue. Products: ammonia (550,000 mt/y), urea (330,000 mt/y).

BASF AG
Ludwigshafen. Feed: fuel oil, naphtha, natural gas. Products: acetic acid (40,000 mt/y), acetylene (85,000 mt/y), acrylic acid (210,000 mt/y), ammonia (700,000 mt/y), butanols (220,000 mt/y), caprolactam (150,000 mt/y), ethylbenzene (350,000 mt/y), ethylene (450,000 mt/y), ethylene oxide (150,000 mt/y), formaldehyde (1,200,000 mt/y), melamine (40,000 mt/y), methanol (220,000 mt/y), higher oxoalcohols (50,000 mt/y), 2-ethylhexanol (175,000 mt/y), phthalic anhydride (90,000 mt/y), polyamide (85,000 mt/y), ld polyethylene (18,000 mt/y), polyisobutylene (6,000 mt/y), polypropylene (10,000 mt/y), polystyrene (265,000 mt/y), polyvinyl chloride (150,000 mt/y), propanol (25,000 mt/y), propylene (240,000 mt/y), propylene glycol (40,000 mt/y), propylene oxide (75,000 mt/y), styrene (500,000 mt/y), urea (480,000 mt/y), vinyl chloride (100,000 mt/y), plasticizers (220,000 mt/y).

BAYER AG
Leverkusen. Product: formaldehyde (95,000 mt/y).

Uerdingen. Products: alkyds (30,000 mt/y), aniline (300,000 mt/y), maleic anhydride (10,000 mt/y), phthalic anhydride (40,000 mt/y), polyester (120,000 mt/y).

BP BENZIN UND PETROLEUM AG UND CALIFORNIA CHEMICAL GmbH oHG.
(owned jointly by Chevron Chemical Company and BP Benzin und Petroleum AG)

Dinslaken. Feed: reformate. Products: orthoxylene (24,000 mt/y), paraxylene (20,000 mt/y).

CABOT GmbH

Hanau. Feed: petroleum fractions, natural gas. Product: carbon black (50,000 mt/y).

CHEMISCHE WERKE SAARLOTHRINGEN
(100% CdF Chimie)

Perl/Besch. Feed: ammonia, carbon dioxide, methanol. Products: formaldehyde (43,000 mt/y), urea (200,000 mt/y).

COLUMBIAN CARBON DEUTSCHLAND

Hamburg. Feed: heavy aromatic hydrocarbons. Product: furnace carbon black (30,000 mt/y).

CONDEA CHEMIE GmbH
(owned by Conoco Inc. and Deutsche Texaco AG)

Brunsbüttel. Feed: ethylene, hydrogen. Products: synthetic straight chain primary fatty alcohols (75,000 mt/y).

DEGUSSA AG

Bruchhausen. Feed: methyl alcohol. Product: formaldehyde.

Kalscheuren. Feed: aromatic hydrocarbons, coal tar oil. Product: carbon black.

Mainz-Mombach. Feed: methyl alcohol. Product: formaldehyde.

DEUTSCHE MARATHON PETROLEUM GmbH
(subsidiary of Marathon Petroleum Co.)

Burghausen, Bavaria. Feed: refinery streams. Products: benzene (110,000 mt/y), butadiene (80,000 mt/y), ethylene (280,000 mt/y), propylene (130,000 mt/y).

DEUTSCHE SHELL AG

Cologne-Godorf. Feed: pyrolysis gasoline, reformate. Products: benzene (400,000 mt/y), orthoxylene (100,000 mt/y), paraxylene (75,000 mt/y), toluene (10,000 mt/y).

DEUTSCHE SOLVAY-WERKE GmbH

Rheinberg. Feed: ethylene. Products: polyvinyl chloride, vinyl chloride.

DEUTSCHE TEXACO AG

Heide. Feed: refinery products. Products: benzene (34,000 mt/y), butylenes (28,000 mt/y), ethylbenzene (11,000 mt/y), ethylene (80,000 mt/y), MTBE (12,500 mt/y), orthoxylene (12,000 mt/y), parametaxylene (38,000 mt/y), propylene (55,000 mt/y), toluene (75,000 mt/y).

Meerbeck und Homberg. Feed: refinery products and chemicals. Products: acetone (36,000 mt/y), alkylbenzene (25,000 mt/y), alkyl chlorides (2,000 mt/y), isopropanol (140,000 mt/y), maleic anhydride (7,500 mt/y), plasticizers (24,000 mt/y), resins (36,000 mt/y), alcohols-ketones (99,000 mt/y).

DOW CHEMICAL

Rheinmuenster. Products: SB-latex, resins.

Stade. Products: bisphenol, propylene oxide, propylene glycol, resins, solvents.

DYNAMIT NOBEL AG

Luisdorf. Products: dimethyl terephthalate (400,000 mt/y), ethylene dichloride (85,000 mt/y).

Steyerberg. Feed: methanol, paraxylene. Product: dimethyl terephthalate (180,000 mt/y).

EC ERDOLCHEMIE GmbH
(owned by Bayer AG and Deutsche BP AG)

Worringen, Cologne. Feed: naphtha. Products: acrylonitrile (280,000 mt/y), ammonia (300,000 mt/y), aromatics mix (200,000 mt/y), butadiene (245,000 mt/y), butylenes (90,000 mt/y), ethanol (40,000 mt/y), ethylene (740,000 mt/y), ethylene glycol (150,000 mt/y), ethylene oxide (150,000 mt/y), propylene (520,000 mt/y), propylene glycol (24,000 mt/y), propylene oxide (135,000 mt/y), toluene (100,000 mt/y).

ESSO CHEMIE GmbH

Cologne. Feed: refinery stocks. Products: butadiene (20,000 mt/y), butylenes (18,000 mt/y), ethylene (450,000 mt/y), polyisobutylene (45,000 mt/y), propylene (240,000 mt/y).

Hamburg. Feed: refinery. Product: solvents (100,000 mt/y).

HOECHST AG

Frankfurt. Feed: ethylene, propylene, natural gas. Products: acetaldehyde (130,000 mt/y), acetic acid (145,000 mt/y), vinyl acetate (150,000 mt/y), hd polyethylene (130,000 mt/y), polyvinyl alcohol (25,000 mt/y).

Gendorf. Feed: ethylene. Products: ethylene glycol-ethylene oxide (120,000 mt/y), vinyl chloride (110,000 mt/y), polyvinyl chloride (150,000 mt/y).

Gersthofen. Feed: p-xylene, methanol. Product: dimethyl terephthalate (115,000 mt/y).

Kelsterbach. Feed: olefins. Products: ethylene glycol-ethylene oxide (45,000 mt/y), polypropylene (135,000 mt/y).

Knapsack. Feed: olefins. Products: acetaldehyde (120,000 mt/y), acetic acid (70,000 mt/y), acetic anhydride (80,000 mt/y), polypropylene (85,000 mt/y), hd polyethylene (100,000 mt/y), polyvinyl chloride (90,000 mt/y), vinyl chloride (100,000 mt/y).

Muenchsmuenster. Feed: ammonia, ethylene, propylene. Products: acrylonitrile (90,000 mt/y), hd polyethylene (80,000 mt/y).

Offenbach. Feed: p-xylene, methanol. Product: dimethyl terephthalate (95,000 mt/y).

HÜLS

Marl. Products: acetaldehyde (80,000 mt/y), acetic acid (40,000 mt/y), acetylene (120,000 mt/y), alkylbenzene (80,000 mt/y), butanol (90,000 mt/y), butylenes (30,000 mt/y), butyraldehyde (310,000 mt/y), cumene (110,000 mt/y), ethanol (130,000 mt/y), ethylbenzene (300,000 mt/y), ethylene (50,000 mt/y), ethylchloride (29,900 mt/y), ethylene dichloride (250,000 mt/y), ethylene glycol (90,000 mt/y), ethylene oxide (150,000 mt/y), isopropanol (110,000 mt/y), maleic anhydride (30,000 mt/y), oxoalcohols (200,000 mt/y), phthalic anhydride (190,000 mt/y), polyamide 12 (14,000 mt/y), polyester (21,000 mt/y), polyethylene (110,000 mt/y), polypropylene (120,000 mt/y), polystyrene (115,000 mt/y), polyvinyl chloride (380,000 mt/y), propylene glycol (21,000 mt/y), propylene oxide (27,000 mt/y), styrene (250,000 mt/y), vinyl chloride (380,000 mt/y), EPS (60,000 mt/y).

ICI

Waldshut. Product: polyvinyl chloride (25,000 mt/y).

Wilhelmshaven. Product: polyvinyl chloride (150,000 mt/y).

PHENOLCHEMIE GmbH

Gladbeck. Feed: cumene. Products: acetone (250,000 mt/y), phenol (400,000 mt/y).

PHILLIPS PETROLEUM INTERNATIONAL GmbH

Hannover. Feed: aromatic oils. Product: carbon black (50,000 mt/y).

RHEINISCHE OLEFINWERKE GmbH

Wesseling. Feed: gas oil, naphtha. Products: butadiene (150,000 mt/y), ethylene (650,000 mt/y), ethylbenzene (430,000 mt/y), ld polyethylene (400,000 mt/y), hd polyethylene (215,000 mt/y), polyisobutylene (8,000 mt/y), polypropylene (130,000 mt/y), propylene (300,000 mt/y), styrene (420,000 mt/y), TR rubber (30,000 mt/y).

RUHRCHEMIE AG

Oberhausen, Holten. Feed: olefins. Products: oxoalcohols (335,000 mt/y), hd polyethylene (80,000 mt/y).

RUHR OEL GMBH
(50% Veba Oel AG, 50% Petróleos de Venezuela SA)

Gelsenkirchen. Feed: crude oil, refinery products. Products: ammonia (400,000 mt/y), benzene (310,000 mt/y), cumene (330,000 mt/y), cyclohexane (100,000 mt/y), ethylene (400,000 mt/y), methanol (200,000 mt/y), orthoxylene (115,000 mt/y), n-paraffins (100,000 m/ty), paraxylene (120,000 mt/y), propylene (245,000 mt/y), toluene (90,000 mt/y).

Münchsmünster. Feed: LPG, naphtha. Products: ethylene (200,000 m/ty), propylene (130,000 mt/y).

UNION RHEINISCHE BRAUNKOHLEN KRAFTSTOFF AG

Wesseling. Feed: LPG, natural gas, pyrolysis gasoline, reformate, resid, refinery gas, xylene mix. Products: benzene (120,000 mt/y), ethylene (440,000 mt/y), methanol (400,000 mt/y), orthoxylene (32,000 mt/y), paraxylene (72,000 mt/y), propylene (260,000 mt/y), toluene (80,000 mt/y), xylene mix (62,000 mt/y).

WACKER-CHEMIE GmbH

Burghausen/Obb. Feed: ethylene. Products: acetaldehyde, acetic acid, acetic anhydride, ethylene dichloride, plasticizers, polyvinyl acetate, polyvinyl alcohol, polyvinyl chloride, vinyl acetate, vinyl chloride, solvents.

WINTERSHALL AG

Ibbenbüren. Feed: benzene, chlorine, n-paraffins. Product: alkylbenzene (36,000 mt/y).

Lingen-Ems. Feed: reformate, benzene-hydrogen, kerosine. Products: benzene (72,000 mt/y), cyclohexane (100,000 mt/y), normal paraffins (30,000 mt/y).

Mannheim. Feed: pyrolysis-gasoline, reformate. Products: benzene (270,000 mt/y), xylene mix (105,000 mt/y).

GREECE

DOW CHEMICAL

Lavrion. Product: polystyrene.

EKO CHEMICALS CO. AE

Thessaloniki. Feed: naphtha, refinery cuts, vinyl chloride. Products: ammonia (118,000 mt/y), ethylene (15,000 mt/y), polyvinyl chloride (65,000 mt/y), solvents (45,000 mt/y).

HADJILUCAS SA

Halkis. Feed: methanol. Product: formaldehyde (20,000 mt/y).

HUNGARY

HUNGARIAN OIL AND GAS TRUST

Százhalombatta. Feed: pyrolysis gasoline, reformate, vac gas oil (FCC unit). Products: benzene (110,000 mt/y), maleic anhydride (10,000 mt/y), orthoxylene (15,000 mt/y), propylene (42,000 mt/y), toluene (110,000 mt/y), xylene mix (85,000 mt/y).

INDIA

ADARSH CHEMICALS & FERTILIZERS LTD.

Udhna, Gujarat. Feed: benzene. Product: maleic anhydride (3,000 mt/y).

AHMEDABAD MANUFACTURING & CALICO PRINTING CL

Baroda. Feed: dimethyl terephthalate, ethylene glycol. Product: polyester (7,968 mt/y).

ALKALI & CHEMICAL CORP. OF INDIA LTD.

Rishra, West Bengal. Feed: alcohol. Products: ethylene (12,000 mt/y), ld polyethylene (12,000 t/y).

BAKELITE HYLAM LTD.

Sanathnagar, Hyderabad. Feed: phenol, formaldehyde, styrene, maleic-phthalic anhydride, isophthalic acid, propylene glycol. Products: formaldehyde (3,000 mt/y), phenolic resins (1,800 mt/y), polyester resins (1,800 mt/y).

BONGAIGAON REFINERY & PETROCHEMICALS LTD.

Dhaligaon, Assam. Feed: 110-145°C cut naphtha TBP. Products: dimethyl terephthalate (45,000 mt/y), orthoxylene (6,000 mt/y), paraxylene (29,000 mt/y).

CHEMICALS & PLASTICS INDIA LTD.

Krishnagiri. Feed: molasses. Product: ethanol (12,000 mt/y).

Metturdam. Feed: chlorine, ethanol. Products: ethylene (18,700 mt/y), ethylene dichloride (37,000 mt/y), polyvinyl chloride (21,300 mt/y), vinyl chloride (22,000 mt/y).

COROMANDEL FERTILIZERS LTD.
(International Minerals & Chemicals Corp., Chevron Chemical Corp., E.I.D. Parry (India) Ltd.)

Visakhapatnam, Andhra Pradesh. Feed: naphtha. Products: ammonia (114,500 mt/y), urea (108,000 mt/y).

FERTILIZER CORP. OF INDIA LTD.

Gorakhpur, Uttar Pradesh. Feed: naphtha. Products: ammonia (171,000 mt/y), urea (285,000 mt/y).

Ramagundam, Andhra Pradesh. Feed: coal. Products: ammonia (297,000 mt/y), urea (495,000 mt/y).

Sindri, Bihar. Feed: fuel oil. Products: ammonia (297,000 mt/y), urea (330,000 mt/y).

Talcher, Orissa. Feed: coal. Products: ammonia (297,000 mt/y), urea (495,000 mt/y).

FERTILIZERS AND CHEMICALS, TRAVANCORE LTD. (FACT) and FACT ENGINEERING AND DESIGN ORGANIZATION (FEDO)

Ambalamedu (near Cochin), Kerala. Feed: naphtha. Products: urea (1,000 mt/d).

GARWARE NYLONS LTD.

Pimpri, Poona. Feed: caprolactam, dimethyl terephthalate, ethylene glycol. Products: nylon 6 (4,830 mt/y), polyamide (360 mt/y), polyester (1,576 mt/y).

GUJARAT NARMADA VALLEY FERTILIZERS CL

Narmadanagar, Bharuch. Feed: fuel oil. Products: ammonia (1,300 mt/d), methanol (60 mt/d), urea (1,800 mt/d).

GUJARAT STATE FERTILIZERS CL

Fertilizernagar (near Baroda). Feed: benzene, fuel oil, naphtha, natural gas, urea. Products: ammonia (348,000 mt/y), caprolactam (20,000 mt/y), cyclohexane (22,500 mt/y), nylon 6 (4,000 mt/y), urea (367,200 mt/y).

HERDILLIA CHEMICALS LTD.

Thane, Bombay. Feed: benzene, propylene, orthoxylene, 2-ethyl hexanol. Products: acetone (11,430 mt/y), cumene (29,800 mt/y), phenol (19,050 mt/y), phthalic anhydride (8,600 mt/y), plasticizers (9,500 mt/y), solvents (2,400 mt/y), styrene (900 mt/y).

HINDUSTAN FERTILIZER CORP. LTD.

Barauni (Bihar). Feed: naphtha. Products: ammonia (600 mt/d), urea (1,000 mt/d).

Durgapur. Feed: naphtha. Products: ammonia (600 mt/d), urea (1,000 mt/d).

Haldia. Feed: fuel oil. Products: ammonia (600 mt/d), methanol (125 mt/d), urea (500 mt/d).

Namrup (Assam). Feed: natural gas. Products: ammonia (1,400 mt/d), urea (2,167 mt/d).

HINDUSTAN ORGANIC CHEMICALS LTD.
(Government of India enterprise)

Rasayani, Raigad. Products: acetic acid (1,330 mt/y), acetic anhydride (2,000 mt/y), formaldehyde (15,000 mt/y).

HINDUSTAN POLYMERS
(A unit of McDowell & CL)

Visakhapatnam. Feed: benzene, molasses. Products: ethylene (3,300 mt/y), styrene (13,936 mt/y), polystyrene (10,156 mt/y).

IEL LTD.

Kanpur, Uttar Pradesh. Feed: naphtha. Products: ammonia (411,000 mt/y), urea (675,000 mt/y).

ILAC LTD.
(100% Ahmedabad Mfg. & Calico Printing CL)

Bombay. Feed: acetylene. Product: polyvinyl chloride (25,000 mt/y), vinyl chloride (6,500 mt/y).

INDIAN FARMERS FERTILIZER COOPERATIVE

Kalol, Gujarat. Feed: natural gas. Products: ammonia (300,000 mt/y), urea (396,000 mt/y).

Phulpur, Uttar Pradesh. Feed: ammonia. Products: ammonia (297,000 mt/y), urea (495,000 mt/y).

INDIAN OIL CORP. LTD.

Jawaharnagar. Feed: reformate. Products: benzene (45,000 mt/y), toluene (16,000 mt/y).

INDIAN PETROCHEMICALS CORP. LTD.

Baroda, Gujarat. Feed: naphtha. Products: acrylonitrile (24,000 mt/y), alkylbenzene (30,000 mt/y), benzene (23,600 mt/y), butadiene (22,000 mt/y), carbon black feedstock (17,900 mt/y), dimethyl terephthalate (30,000 mt/y), ethylene (130,000 mt/y), ethylene dichloride (100,000 mt/y), ethylene glycol (20,000 mt/y), ethylene oxide (5,000 mt/y), normal paraffins (25,000 mt/y), orthoxylene-mixed xylene (23,500 mt/y), paraxylene (17,000 mt/y), polybutadiene rubber (20,000 mt/y), ld polyethylene (80,000 mt/y), polypropylene (30,000 mt/y), polyvinyl chloride (55,000 mt/y), propylene (81,300 mt/y), solvents (20,000 mt/y), vinyl chloride (57,300 m/ty).

MADRAS FERTILIZERS LTD.

Manali. Feed: naphtha. Products: ammonia (247,500 mt/y), urea (292,000 mt/y).

MYSORE PETROCHEMCIALS LTD.

Raichur, Karnataka. Feed: orthoxylene. Product: phthalic anhydride (9,000 mt/y).

NAGARJUNA FERTILIZERS AND CHEMICALS LTD.

Kakinada. Feed: naphtha, natural gas. Products: ammonia (900 mt/d), toluene (1,500 mt/d).

NATIONAL FERTILIZERS LTD.

Bhatinda, Punjab. Feed: fuel oil, low sulfur heavy stock. Products: ammonia (297,000 mt/y), urea (511,000 mt/y).

Naya Nangal, Punjab. Feed: fuel oil, low sulfur heavy stock. Products: ammonia (297,000 mt/y), methanol (16,500 mt/y), urea (330,000 mt/y).

Panipat, Haryana. Feed: fuel oil, low sulfur heavy stock. Products: ammonia (297,000 mt/y), urea (511,500 mt/y).

NATIONAL ORGANIC CHEMICAL INDUSTRIES LTD.

Thane. Feed: naphtha. Products: acetone (14,000 mt/y), benzene (17,000 mt/y), butadiene (7,200 mt/y), butanol (6,000 mt/y), ethylene (63,000 mt/y), ethylene dichloride (50,000 mt/y), ethylene glycol-diethylene glycol (11,000 mt/y), ethylene oxide (14,000 mt/y), isopropanol (4,000 mt/y), oxoalcohols (10,000 mt/y), polyvinyl chloride (21,500 mt/y), propylene (37,000 mt/y), vinyl chloride (30,000 mt/y)

PHILLIPS CARBON BLACK LTD.
(owned by Phillips Petroleum, Duncan Bros. CL, and public)

Durgapur, West Bengal. Feed: heavy oil. Product: carbon black (40,000 mt/y).

POLYCHEM LTD.

Baroda. Feed: acrylonitrile, butadiene, styrene. Product: ABS (2,000 mt/y).

Bombay. Feed: benzene, ethylene. Products: divinyl benzene (150 mt/y), ethylbenzene (17,000 mt/y), ethylene (2,000 mt/y), polystyrene (16,000 mt/y), styrene (14,000 mt/y), toluene (700 mt/y).

Nira (Maharashtra). Feed: acetic acid, ethanol, molasses, oxygen. Product: ethanol (7,270 mt/y), ethylene (4,000 mt/y), vinyl acetate monomer (10,000 mt/y).

POLYOLEFINS INDUSTRIES LTD. (PIL).

Thana, Maharashtra. Feed: ethylene. Product: hd polyethylene (44,000 mt/y).

RASHTRIYA CHEMICALS & FERTILIZERS LTD.

Trombay, Bombay. Feed: associated gas. Products: ammonia (90,000 mt/y), methanol (37,000 mt/y).

SHRI AMBUJA PETROCHEMICALS LTD.

Patancheru, Medak District. Feed: orthoxylene. Product: phthalic anhydride (8,600 mt/y).

SHRIRAM FERTILIZERS AND CHEMICALS

Kota, Rajasthan. Feed: naphtha. Products: ammonia (200,000 mt/y), urea (330,000 mt/y).

SOUTHERN PETROCHEMICAL INDUSTRIES CORP. LTD.

Tuticorin, Tamil Nadu. Feed: naphtha. Products: ammonia (352,000 mt/y), urea (512,000 mt/y).

SYNTHETICS AND CHEMICALS LTD.
(with Kilachand Devchand & Co. and Firestone Tire & Rubber Co.)

Bareilly, Uttar Pradesh. Feed: benzene, ethanol, petrobutadiene. Products: acetaldehyde (22,000 mt/y), butadiene (25,200 mt/y), ethylene (4,000 mt/y), styrene (11,250 mt/y), NBR (2,000 mt/y), SBR (33,000 mt/y).

THIRUMALAI CHEMICALS LTD.

Ranipet (T.N.). Feed: orthoxylene. Products: maleic anhydride (1,000 mt/y), phthalic anhydride (20,000 mt/y).

UNION CARBIDE INDIA LTD.

Bombay. Feed: alcohol, naphtha. Products: acetaldehyde (11,000 mt/y), acetic acid (2,000 mt/y), acetylene (900 mt/y), aromatics mix (5,400 mt/y), benzene (2,800 mt/y), butanol (4,200 mt/y), ethylene (22,450 mt/y), polyethylene (20,425 mt/y), propylene (5,500 mt/y), toluene (2,000 mt/y), solvents (6,000 mt/y).

UNITED CARBON INDIA LTD.

Thane. Feed: lube extracts, naphtha cracker bottoms. Product: carbon black (35,700 mt/y).

ZUARI AGRO CHEMICALS LTD.
(Birla Gwalior Pvt. Ltd., U.S. Steel Corp., and public interests)

Zuarinagar. Feed: naphtha. Products: ammonia (220,000 mt/y), urea (340,000 mt/y).

INDONESIA

PERTAMINA
(state oil company)

Plaju, South Sumatra. Feed: propylene. Product: polypropylene (20,000 mt/y).

Rantau, North Sumatra. Feed: natural gas. Product: carbon black (5,000 mt/y).

PERUM PETROKIMIA GRESIK.

Gresik, Surabaya. Feed: fuel oil. Products: ammonia (3,600 mt/y), urea (45,000 mt/y).

P. T. PUSRI

Palembang, South Sumatra. Feed: natural gas. Product: urea (480,000 mt/y).

P. T. PUPUK KUJANG

Cikampek, Java. Feed: natural gas. Products: ammonia (330,000 mt/y), urea (570,000 mt/y).

IRELAND

NITRIGIN EIREANN TEORANTA

Marino Point, Cork. Feed: natural gas. Products: ammonia (435,000 mt/y), urea (330,000 mt/y).

ISRAEL

ELECTROCHEMICAL INDUSTRIES (FRUTAROM) LTD.

Near Akko. Feed: ethylene. Products: ethylene dichloride (35,000 mt/y), polyvinyl chloride (97,000 mt/y), vinyl chloride (100,000 mt/y).

FERTILIZERS & CHEMICALS LTD.
Haifa. Feed: LP-gas, naphtha, Bunker C. Products: ammonia (80,000 mt/y), urea (32,000 mt/y).

GADOT PETROCHEMICAL INDUSTRIES LTD.
Haifa Bay. Feed: reformate, pyrolysis gasoline. Products: aromatics mix (150,000 mt/y), benzene (40,000 mt/y), orthoxylene (15,000 mt/y), paraxylene (20,000 mt/y), phthalic anhydride (12,000 mt/y), toluene (50,000 mt/y), xylene mix (80,000 mt/y).

ISRAEL PETROCHEMICAL ENTERPRISES LTD.
Haifa. Feed: ethylene, styrene. Products: ld polyethylene (100,000 mt/y), polystyrene (16,000 mt/y).

ITALY

AQUILA SpA
Trieste. Feed: catalytic reformate. Products: benzene (10,000 mt/y), toluene (32,500 mt/y), xylene mix (17,000 mt/y).

ASHLAND CHEMICAL ITALIANA SpA
Milan. Products: acrylics (1,000 mt/y), alkyds (8,000 mt/y).

AUSIND SpA
(Montedison Group)
Castellanza. Feed: methane. Products: formaldehyde (300,000 mt/y), melamine (26,000 mt/y), methanol (120,000 mt/y), urea (100,000 mt/y).

CABOT ITALIANA SpA
(subsidiary of Cabot Corp., Boston, Mass.)
Ravenna. Feed: petroleum fractions, aromatic tar. Product: carbon black (75,000 mt/y).

CHIMICA DEL FRIULI
(Snia Viscosa group)
Torviscosa (Udine). Product: caprolactam (20,000 mt/y).

CHIMICA DEL TIRSO
(50% EniChem, 50% Montefibre)
Ottana (Sardinia). Feed: paraxylene. Product: terephthalic acid (80,000 mt/y).

CHIMICA DI COLLEFERRO SpA
(Snia Viscosa group)
Colleferro. Product: polyester (40,000 mt/y).

COLUMBIAN/CARBON EUROPA SpA
Trecate. Feed: heavy aromatic hydrocarbons. Product: furnace carbon black (50,000 mt/y).

DISTILLERIE ITALIANE
(divisione della Alusuisse Italia)
San Giovanni Valdarno (Arezzo). Products: acrylic acid-esters (2,500 mt/y), polyester (30,000 mt/y), solvents (14,000 mt/y), plasticizers (64,000 mt/y).

DOW CHEMICAL SpA
Livorno. Products: polystyrene, SB-latex.

DUTRAL
(Montedison Group)
Ferrara. Product: EPR (60,000 mt/y).

ENICHEM
Gela. Feed: naphtha, natural gas. Products: acrylonitrile (90,000 mt/y), ammonia (220,000 mt/y), aromatics (150,000 mt/y), benzene (80,000 mt/y), butadiene (40,000 mt/y), ethylene (310,000 mt/y), ethylene dichloride (125,000 mt/y), ethylene glycol (46,000 mt/y), ethylene oxide (40,000 mt/y), ld polyethylene (90,000 mt/y), hd polyethylene (40,000 mt/y), polypropylene (50,000 mt/y), propylene (160,000 mt/y), toluene (90,000 mt/y), urea (200,000 mt/y), xylene mix (80,000 mt/y).
Manfredonia. Feed: natural gas. Products: ammonia (360,000 mt/y), urea (630,000 mt/y).
Pisticci. Feed: natural gas. Products: acrylic esters (7,000 mt/y), methanol (65,000 mt/y).
Ragusa. Feed: ethylene. Product: ld polyethylene (140,000 mt/y).
Ravenna. Feed: natural gas. Products: acetic acid (30,000 mt/y), acetylene (60,000 mt/y), ammonia (310,000 mt/y), butadiene (100,000 mt/y), isoprene (30,000 mt/y), polybutadiene (45,000 mt/y), polyisoprene (30,000 mt/y), polyvinyl acetate (25,000 mt/y), styrene (41,000 mt/y), urea (70,000 mt/y), vinyl acetate (30,000 mt/y), ABS (40,000 mt/y), SBR (150,000 mt/y), SBR latex (30,000 mt/y), nitrile (8,000 mt/y), solvents (100,000 mt/y).

FAR—Fabrica Adesivi Resine
Filago, Bergamo District. Products: formaldehyde (100,000 mt/y), acrylics (20,000 mt/y).

FERTIMONT SpA
(Montedison Group)
Ferrara. Feed: natural gas. Products: ammonia (450,000 mt/y), urea (500,000 mt/y).
Porto Marghera. Feed: natural gas. Products: ammonia (160,000 mt/y), urea (160,000 mt/y).
Priolo. Feed: natural gas. Products: ammonia (300,000 mt/y).
San Giuseppe di Cairo. Feed: natural gas. Products: ammonia (165,000 mt/y), urea (180,000 mt/y).

FTALITAL
(divisione della Alusuisse Italia)
Scanzorosciate (Bergamo). Feed: benzene, butane, naphthalene, orthoxylene. Products: maleic anhydride (38,000 mt/y), phthalic anhydride (80,000 mt/y).

ICAM
(100% EniChem)
Priolo. Feed: naphtha, gas oil. Products: ethylene (600,000 mt/y), propylene.

HIMONT ITALIA
Brindisi. Feed: propylene. Product: polypropylene (120,000 mt/y).
Ferrara. Feed: propylene. Product: polypropylene (85,000 mt/y).
Terni. Feed: propylene. Product: polypropylene (140,000).

INDUSTRIA ITALIANA PETROLI SpA
Rho. Feed: crude oil. Products: benzene (14,400 mt/y), toluene (24,000 mt/y), xylene mix (8,600 mt/y).

MOBIL CHIMICA ITALIANA
Naples. Feed: light naphtha, hp reformate. Products: benzene (76,000 mt/y), cyclohexane (40,000 mt/y), orthoxylene (63,000 mt/y), paraxylene (66,000 mt/y), toluene (50,000 mt/y), xylene mix (52,000 mt/y).

MONTEDIPE
(Montedison Group)
Ferrara. Product: polyester (6,500 mt/y).
Mantova. Products: acetone (140,000 mt/y), ethylbenzene (350,000 mt/y), ethylene dichloride (200,000 mt/y), maleic anhydride (11,000 mt/y), phenol (230,000 mt/y), polystyrene (270,000 mt/y), styrene (350,000 mt/y).
Porto Marghera. Products: acetic acid (65,000 mt/y), acetylene (40,000 mt/y), caprolactam (100,000 mt/y), ethylene (350,000 mt/y), propylene (180,000 mt/y), vinyl acetate (55,000 mt/y).
Priolo. Products: acetaldehyde (140,000 mt/y), ethylene dichloride (190,000 mt/y), ethylene oxide (15,000 mt/y), propylene glycol (13,000 mt/y), propylene oxide (40,000 mt/y).

SARAS CHIMICA
(60% EniChem, 20% Saras, 20% Montedison)
Sarroch (Sardinia). Feed: refinery feedstock. Products: cumene (200,000 mt/y), ethylbenzene (40,000 mt/y), n-paraffins (160,000 mt/y), orthoxylene (80,000 mt/y), paraxylene (80,000 mt/y).

SARPOM
Trecate (Novara). Feed: intermediate and heavy virgin naphtha. Products: aromatics mix (18,000 mt/y), cyclohexane (3,000 mt/y), normal paraffins (69,000 mt/y).

SELM-Societa Energia Montedison
(Montedison Group)
Priolo. Feed: naphtha, pyrolysis gasoline, propylene. Products: benzene (350,000 mt/y), cumene (270,000 mt/y), ethylbenzene (70,000 mt/y), orthoxylene (75,000 mt/y), paraxylene (130,000 mt/y), toluene (200,000 mt/y).

SOCIETA CHIMICA DAUNA
(50% EniChem, 50% Snia Viscosa)
Manfredonia, Foggia. Feed: toluene. Product: caprolactam (80,000 t/y).

SOCIETA CHIMICA RAVENNA
Ravenna. Products: polyvinyl chloride (140,000 mt/y), vinyl chloride (154,000 mt/y).

SOLVAY & CIE. SA
Ferrara. Feed: vinyl chloride monomer. Products: polyvinyl chloride.
Rosignano. Feed: ethylene. Product: hd polyethylene.

TECNOPOLIMERI SpA
(Snia Viscosa group)
Ceriano Laghetto (Milan). Feed: caprolactam, PA66. Product: polyamide (27,000 mt/y).

TERNI INDUSTRIE CHIMICHE SpA
Nera Montoro (Terni). Feed: natural gas. Products: ammonia (120,000 mt/y), urea (100,000 mt/y).

VEDRIL
(Montedison Group)
Rho. Feed: ach. Product: acrylics (60,000 mt/y).

VINAVIL SpA
(Montedison Group)
Villadossola. Products: acrylics (11,000 mt/y), polyvinyl alcohol (2,000 mt/y), polyvinyl acetate (64,000 mt/y), polyvinyl acetate-ethylene (25,000 mt/y).

JAPAN

A. G. INTERNATIONAL CHEMICAL CL
(subsidiary of Mitsubishi Gas Chemical Cl)
Mizushima. Feed: m-xylene. Product: isophthalic acid (35,000 mt/y).

ASAHI CHEMICAL INDUSTRY CL
Kawasaki. Products: acrylic esters (20,000 mt/y), acrylonitrile (89,760 mt/y), acrylics (26,950 mt/y), polystyrene (55,200 mt/y), styrene (65,000 mt/y), BR-SBR rubber (129,000 mt/y).
Mizushima. Products: acrylonitrile (128,700 mt/y), ammonia (264,000 mt/y), hd polyethylene (82,000 mt/y), ld polyethylene (96,000 mt/y), polystyrene (145,000 mt/y), styrene (330,000 mt/y), ABS (48,000 mt/y), resins (25,000 mt/y), SB latex (14,000 mt/y).
Nobeoka. Product: nylon 66 (15,000 mt/y).

ASAHI GLASS CL
Chiba. Feed: chlorine, natural gas, propylene. Products: ammonia (46,000 mt/y), propylene glycol (14,000 mt/y), propylene oxide (26,000 mt/y).
Kashima. Feed: chlorine, propylene. Products: propylene glycol (26,000 mt/y), propylene oxide (60,000 mt/y).

ASIA OIL CL
Yokohama. Feed: refinery streams. Product: benzene (100,000 mt/y).

CHIBA BUTADIENE INDUSTRY CL
(joint venture of Maruzen Petrochemical Co. and Ube Kosan Co.)
Goi-minamikaigan, Chiba. Feed: C_4. Product: butadiene (75,000 mt/y).

CHIBA EDC CL
Chiba. Feed: chlorine, ethylene. Product: ethylene dichloride (80,000 mt/y).

CHIBA VCM CL

Chiba. Feed: ethylene, ethylene dichloride. Product: vinyl chloride (160,000 mt/y).

CHISSO CORP.

Minamata and Mizushima. Feed: acetic acid, ethylene, vinyl chloride monomer. Products: acetic anhydride (5,200 mt/y), polyvinyl chloride (76,000 mt/y).

CHISSO PETROCHEMICAL CORP.

Goi. Feed: ethylene, propylene. Products: oxoalcohols (50,000 mt/y), hd polyethylene (35,000 mt/y), polypropylene (155,700 mt/y), polyvinyl chloride (50,600 mt/y), solvents (44,000 mt/y), plasticizers (53,000 mt/y).

COSMO OIL CL

Matsuyama. Feed: naphtha. Products: benzene (7,000 mt/y), toluene (25,000 mt/y), xylene mix (50,000 mt/y), solvents (50,000 mt/y).

DAICEL CHEMICAL INDUSTRIES LTD.

Aboshi. Feed: acetic acid, methanol. Products: acetic acid (225,000 mt/y), acetic anhydride (120,000 mt/y).

Fuji, Shizuoka. Feed: methanol. Product: formaldehyde (190,000 mt/y).

Ohtake, Hiroshima. Feed: acetaldehyde, naphtha, propylene. Products: acetic acid (36,000 mt/y), solvents (50,000 mt/y), plasticizers (10,000 mt/y).

DAINIPPON INK & CHEMICALS INC.

Amegasaki, Chiba, Sakai, Yokkaichi. Feed: purchased. Products: alkyds (49,000 mt/y), butylenes (18,000 mt/y), formaldehyde (18,000 mt/y), polyamide (3,000 mt/y), polyester (62,000 mt/y), polystyrene (70,500 mt/y), SBR (6,000 mt/y).

DENKI KAGAKU KOGYO KABUSHIKI KAISHA

Goi, Chiba Prefecture. Feed: acetic acid, benzene, ethylene, vinyl chloride. Products: ABS (40,000 mt/y), ethylbenzene (185,000 mt/y), polystyrene (113,500 mt/y), polyvinyl chloride (65,000 mt/y), styrene (160,000 mt/y), vinyl acetate (66,000 mt/y).

Ohmi, Niigata Prefecture. Feed: acetic acid, carbide-acetylene, chlorine. Products: polyvinyl alcohol (28,800 mt/y), polyvinyl chloride (24,000 mt/y), vinyl acetate (60,000 mt/y), vinyl chloride (42,000 mt/y).

FUJI OIL CL

Sodegaura, Chiba. Feed: naphtha. Product: n-paraffins (15,000 mt/y).

GENERAL PETROCHEMICAL INDUSTRIES LTD.

Sakai. Feed: naphtha. Products: benzene (30,000 mt/y), toluene (120,000 mt/y), xylene mix (150,000 mt/y).

IDEMITSU PETROCHEMICAL CL

Chiba. Feed: naphtha. Products: benzene (150,000 mt/y), paraxylene (130,000 mt/y), hd polyethylene (82,000 mt/y), polypropylene (80,000 mt/y), polystyrene (30,000 mt/y), styrene (160,000 mt/y).

Tokuyama. Feed: naphtha. Products: benzene (180,000 mt/y), cyclohexane (90,000 mt/y), ethylene (380,000 mt/y), polystyrene (60,000 mt/y), propylene (220,000 mt/y), styrene (91,000 mt/y—joint ownership with Nippon Zeon), toluene (74,000 mt/y), xylene mix (102,000 mt/y).

JAPAN ALDEHYDE CL

Chiba. Feed: ethylene. Product: acetaldehyde (60,000 mt/y).

JAPAN BUTYL CL

Kashima. Product: butyl rubber (25,000 mt/y).

Kawasaki. Feed: isobutylene, isoprene. Product: butyl rubber (65,000 mt/y).

JAPAN ETHANOL CL

Yokkaichi. Feed: ethylene. Product: ethanol (40,000 mt/y).

JAPAN LACTAM CL

Niihama. Feed: cyclohexene, hydroxylamine. Product: caprolactam (72,000 mt/y).

JAPAN PHENOL CL

Kashima. Feed: cumene. Products: acetone (60,000 mt/y), phenol (100,000 mt/y).

JAPAN PHTHALIC CL

(subsidiary of Mitsubishi Gas Chemical Cl)

Mizushima. Feed: o-xylene. Product: phthalic anhydride (75,000 mt/y).

JAPAN SYNTHETIC ALCOHOL CL

Kawasaki. Feed: ethylene. Product: ethanol (40,000 mt/y).

JAPAN SYNTHETIC RUBBER CL

Chiba. Feed: butadiene. Products: polybutylene resins (10,000 mt/y), polybutadiene rubber (50,000 mt/y).

Kashima. Feed: C_4-C_5 streams. Products: butadiene (50,000 mt/y), isoprene (30,000 mt/y), polyisoprene (30,000 mt/y).

Yokkaichi. Feed: acrylonitrile, C_4 stream, ethylene, propylene, styrene. Products: butadiene (95,000 mt/y), ABS (85,000 mt/y), AES (10,000 mt/y), polybutadiene (25,000 mt/y), EPR (40,000 mt/y), SB latex (65,000 mt/y), SBR. HSR, NBR (255,000 mt/y).

KASHIMA VINYL CHLORIDE MONOMER CL

Kashima. Feed: ethylene. Product: vinyl chloride (270,000 mt/y).

KAWASAKI KASEI CHEMICALS LTD.

Kawasaki. Feed: crude naphthalene, orthoxylene, oxoalcohols, phthalic anhydride. Products: naphthalene (12,000 mt/y), phthalic anhydride (72,000 mt/y), plasticizers (57,000 mt/y).

KURARAY CL

Okayama. Feed: ethylene. Products: polyvinyl alcohol (225 mt/d).

Nakajo. Product: polyvinyl alcohol (120 mt/d).

KURARAY-ISOPRENE CHEMICAL CL

Kashima. Feed: butene, butane. Products: isoprene (30,000 mt/y).

KURARAY YUKA CL

Yokkaichi City. Feed: paraxylene. Product: terephthalic acid (53,000 mt/y).

KYODO SAKUSAN CL

(subsidiary of Daicel Chemical Industries Ltd.)

Aboshi, Himeji, Hyogo. Feed: methanol. Product: acetic acid (225,000 mt/y).

KYOWA YUKA CL

Yokkaichi. Feed: ethylene, propylene. Products: acetaldehyde (125,000 mt/y), acetone (36,000 mt/y), butanol (60,000 mt/y), butyraldehyde (180,000 mt/y), oxoalcohols (100,000 mt/y).

MARUZEN PETROCHEMICAL CL

Ichihara, Chiba. Feed: naphtha. Products: benzene (120,000 mt/y), butadiene (55,000 mt/y), ethylene (373,000 mt/y), propylene (220,000 mt/y), toluene (69,000 mt/y), xylene mix (51,000 mt/y).

MITSUBISHI CHEMICAL INDUSTRIES LTD.

Kurosaki. Feed: coal, naphtha. Products: ammonia (264,000 mt/y), caprolactam (84,000 mt/y), carbon black (36,000 mt/y), dimethyl terephthalate (60,000 mt/y), nylons (15,000 mt/y), terephthalic acid (270,000 mt/y), urea (264,000 mt/y).

Mizushima. Feed: naphtha, LPG. Products: acetaldehyde (120,000 mt/y), acetone (55,000 mt/y), acrylonitrile (112,000 mt/y), alphaolefins (25,000 mt/y), benzene (200,000 mt/y), butanol (25,000 mt/y), cyclohexane (100,000 mt/y), ethylene (360,000 mt/y), maleic anhydride (18,000 mt/y), oxoalcohols (146,000 mt/y), orthoxylene (27,000 mt/y), paraxylene (50,000 mt/y), ld polyethylene (58,000 mt/y), hd polyethylene (69,000 mt/y), polypropylene (35,000 mt/y), propylene (216,000 mt/y), toluene (60,000 mt/y), xylene mix (30,000 mt/y).

Yokkaichi. Feed: butadiene, styrene. Products: carbon black (84,000 mt/y), SBR (65,000 mt/y).

MITSUBISHI GAS CHEMICAL CI

Mizushima. Feed: mixed xylene. Products: ethylbenzene (60,000 mt/y), maleic anhydride (3,700 mt/y), metaxylene (30,000 mt/y), orthoxylene (90,000 mt/y), paraxylene (120,000 mt/y), xylene mix (240,000 mt/y).

Niigata. Feed: natural gas. Products: ammonia (211,200 mt/y), formaldehyde (220,000 mt/y), methanol (396,000 mt/y), urea (198,000 mt/y).

MITSUBISHI MONSANTO CHEMICAL CO.

Yokkaichi. Feed: acrylonitrile, styrene, SBR. Products: ABS (54,000 mt/y), polystyrene (130,000 mt/y).

MITSUBISHI PETROCHEMICAL CL

Kashima. Feed: naphtha. Products: benzene (175,000 mt/y), cumene (140,000 mt/y), ethylene (299,000 mt/y), ethylene glycol (68,000 mt/y), ethylene oxide (66,000 mt/y), ld polyethylene (60,000 mt/y), lld polyethylene (75,000 mt/y), polypropylene (120,000 mt/y), styrene (160,000 mt/y), xylene mix (41,000 mt/y).

Yokkaichi. Feed: naphtha. Products: acrylic acid-esters (40,000 mt/y), alkylbenzene (65,000 mt/y), benzene (221,000 mt/y), ethylene (210,700 mt/y), ethylene glycol (86,000 mt/y), ethylene oxide (80,000 mt/y), oxoalcohols (30,000 mt/y), ld polyethylene (50,000 mt/y), polypropylene (70,000 mt/y), styrene (150,000 mt/y), toluene (48,000 mt/y), xylene (13,000 mt/y).

MITSUBISHI YUKA BADISCHE CL

(joint venture of BASF and Mitsubishi Petrochemical CL)

Yokkaichi. Feed: styrene. Products: expandable polystyrene (59,000 mt/y).

MITSUI DU PONT POLYCHEMICALS

(50% Mitsui Petrochemical Ind. Ltd., 50% E.I. du Pont de Nemours & Co.)

Chiba. Feed: ethylene. Product: ld polyethylene (100,000 mt/y).

Ohtake. Feed: ethylene. Product: ld polyethylene (50,000 mt/y).

MITSUI PETROCHEMICAL INDUSTRIES LTD.

Chiba. Feed: naphtha. Products: acetone (108,000 mt/y), aniline (30,000 mt/y), benzene (93,000 mt/y), butanol (53,000 mt/y), butylenes (22,000 mt/y), ethylene glycol (109,000 mt/y), ethylene oxide (109,000 mt/y), phenol (180,000 mt/y), hd polyethylene (164,100 mt/y), polypropylene (140,000 mt/y), resins (20,000 mt/y), toluene (54,000 mt/y), xylene mix (44,000 mt/y), ethylene-propylene rubber (30,000 mt/y).

Iwakuni-Ohtake. Feed: naphtha. Products: acetaldehyde (36,000 mt/y), acetone (36,000 mt/y), benzene (62,000 mt/y), phenol (30,000 mt/y), hd polyethylene (4,200 mt/y), md polyethylene (45,000 mt/y), resins (34,000 mt/y), solvents (9,100 mt/y), terephthalic acid (270,000 mt/y), crude terephthalic acid (320,000 mt/y), toluene (46,000 mt/y), xylene mix (39,000 mt/y)

MITSUI TOATSU CHEMICALS INC.

(Licensee of Witco Corp.—Concarb Div.)

Shimonoseki. Feed: heavy aromatic oil, coal tar distillate. Product: carbon black (15,000 mt/y).

Yokoshiba. Feed: heavy aromatic oil, coal tar distillate. Product: carbon black (45,000 mt/y).

MIZUSHIMA AROMA CL

(subsidiary of Mitsubishi Gas Chemical Ci).

Mizushima. Feed: paraxylene. Products: terephthalic acid (115,000 mt/y).

MIZUSHIMA ETHYLENE KK

(50% Mitsubishi Chemical Industries, 50% Sanyo Petrochemicals).

Mizushima. Feed: LPG, naphtha. Products: ethylene (360,000 mt/y), propylene (216,000 mt/y).

NIHON ALKYLATE CL

(Sumitomo Chemical Co. and Kao Soap Co.).

Niihama. Feed: benzene. Product: linear alkylbenzene (31,500 mt/y).

NIHON OXIRANE CL
(Atlantic Richfield, Sumitomo Chemical, Showa Denko).

Chiba. Feed: ethylbenzene, propylene. Products: propylene oxide (90,000 mt/y), styrene (225,000 mt/y).

NIHON POLYSTYRENE CL

Kawasaki. Feed: styrene. Product: polystyrene (58,000 mt/y)

NIHON VINYL CHLORIDE CL
(Sumitomo Chemical Co., Denki Kagaku Kogyo KK).

Chiba. Feed: chlorine, ethylene. Product: ethylene dichloride (80,000 mt/y).

NIPPON CARBIDE INDUSTRIES CI

Toyama. Feed: vinyl chloride monomer. Product: acrylics, polyvinyl chloride (1,500 mt/y).

NIPPON KASEI CHEMICAL CL

Onahama, Fukushima. Feed: creosote oil, methanol. Products: carbon black (28,000 mt/y), formaldehyde (96,000 mt/y).

NIPPON MINING CL

Mizushima. Feed: reformate gasoline. Product: benzene (50,000 mt/y), cyclohexane (60,000 mt/y) n-paraffins (80,000 mt/y), propylene (100,000 mt/y), xylene mix (130,000 mt/y).

NIPPON OIL AND FATS CO.

Oita. Feed: C_4 cut, C_4 LPG. Products: isoparaffins (1,200 mt/y), maleic anhydride (12,000 mt/y), polybutene (8,000 mt/y).

NIPPON PETROCHEMICALS CL

Kawasaki and Ukishima. Feed: LPG, naphtha. Products: benzene (72,000 mt/y), butadiene (60,000 mt/y), isopropanol (60,000 mt/y), n-paraffins (55,000 mt/y), ld polyethylene (145,500 mt/y), polyisobutylene (16,000 mt/y), toluene (42,000 mt/y), xylene (34,000 mt/y).

NIPPON PETROLEUM DETERGENT CL
(45% Chevron Chemical Co., 55% Nippon Petrochemicals Co.)

Kawasaki. Feed: n-paraffin, propylene, benzene. Product: alkylbenzene (85,000 t/y).

NIPPON POLYURETHANE INDUSTRIAL CL

Shin-Nanyo, Yamaguchi. Product: polyester (7,200 t/y).

NIPPON SHOKUBAI KAGAKU KOGYO CL

Himeji. Feed: benzene, naphthalene, orthoxylene, propylene. Products: acrylic acid-acrylic esters (60,000 mt/y), maleic anhydride (36,000 mt/y), phthalic anhydride (80,000 mt/y).

Kawasaki. Feed: ethylene. Products: ethylene glycol (185,000 mt/y), ethylene oxide (185,000 mt/y).

Suita. Feed: ethylene glycols, phthalic anhydride, styrene. Product: alkyds, polyester (48,000 mt/y).

NIPPON ZEON CL

Kawasaki. Feed: acrylonitrile, butadiene, styrene. Products: NBR (30,000 mt/y), SBR (30,000 mt/y).

Mizushima. Feed: vinyl chloride. Product: polyvinyl chloride (130,000 mt/y).

Takaoka. Feed: vinyl chloride. Product: polyvinyl chloride (80,000 mt/y).

Tokuyama. Feed: C_4 stream. Products: butadiene (140,000 mt/y), polybutylene (48,000 mt/y), EBR (10,000 mt/y), SBR-NBR-HS (190,000 mt/y)

NISSAN CHEMICAL INDUSTRIES LTD.

Toyama. Feed: LPG, naphtha. Products: ammonia (113,000 mt/y), melamine (42,000 mt/y), urea (127,000 mt/y).

NISSAN MARUZEN POLYETHYLENE CL

Goi, Chiba. Feed: ethylene. Product: hd polyethylene (70,000 mt/y).

NISSAN NALKEN CORP.

Chiba, Pref. Feed: benzene, n-paraffin. Product: alkylbenzene (40,000 mt/y).

NISSAN PETROCHEMICAL LTD.

Goi, Chiba. Feed: ethylene, olefins, propylene. Products: oxoalcohols (80,000 mt/y), polyvinyl chloride (55,000 mt/y), vinyl chloride (60,000 mt/y).

NISSO MARUZEN CHEMICAL CL

Goi, Ichihara. Feed: ethylene, propylene oxide. Products: ethylene glycol (70,000 mt/y), ethylene oxide (70,000 mt/y), propylene glycol (22,000 mt/y).

NISSO PETROCHEMICAL INDUSTRIES CL.

Yokkaichi. Feed: ethylene. Products: ethylene glycol (60,000 mt/y), ethylene oxide (60,000 mt/y).

OKAYAMA BUTADIENE CL
(Joint venture of Nippon Zeon CL and Asahi Chemical Industry CL).

Mizushima. Feed: C_4 steam. Product: butadiene (140,000 mt/y).

OSAKA GAS CL

Osaka. Feed: coke oven gas oil. Products: benzene (80,000 mt/y), naphthalene (11,000 mt/y), toluene (10,000 mt/y).

OSAKA PETROCHEMICAL INDUSTRIES LTD.

Takaishi, Osaka. Feed: LPG, naphtha. Products: aromatics (225,000 mt/y), benzene (100,000 mt/y), ethylene (300,000 mt/y), propylene (200,000 mt/y), toluene (65,000 m/ty), xylene mix (60,000 mt/y).

SANYO ETHYLENE CL

Mizushima. Feed: naphtha. Products: ethylene (390,000 mt/y), propylene (254,000 mt/y).

SANYO MONOMER CL
(joint venture of Nippon Zeon CL, Asahi Chemical Co., Chisso Corp.)

Mizushima. Feed: ethylene, chlorine. Products: vinyl chloride (175,000 mt/y).

SEITETSU KAGAKU CL

Befu. Products: formaldehyde (32,400 mt/y).

Himeji. Products: formaldehyde (107,000 mt/y), methanol (165,000 mt/y).

SENBOKU POLYMER
(100% Nippon Petrochemicals CL).

Osaka. Product: polypropylene (28,000 mt/y).

SHIN-DAIKYOWA PETROCHEMICAL CL
(Daikyo Oil CL, Toyo Soda Mfg. CL, Kyowa Hakko Kogyo CL, Dainippon Ink and Chemicals Inc., Industrial Bank of Japan).

Yokkaichi. Feed: naphtha. Products: benzene (66,000 mt/y), butylenes (122,900 mt/y), cumene (140,000 mt/y), ethylene (361,300 mt/y), ethylbenzene (142,000 mt/y), hd polyethylene (63,000 mt/y), propylene (220,300 mt/y), styrene (90,000 mt/y), toluene (60,000 mt/y), xylene mix (43,000 mt/y).

SHIN-ETSU CHEMICAL CL

Kashima. Feed: vinyl chloride. Product: polyvinyl chloride (198,000 mt/y).

Shin-Nanyo. Feed: vinyl chloride. Product: polyvinyl chloride (42,000 mt/y).

SHIN-ETSU VINYL ACETATES CL

Sakai. Feed: acetic acid, ethylene. Product: vinyl acetate (80,000 mt/y).

SHOWA ACETYL CHEMICAL CL

Ohita. Feed: ethylene. Products: acetaldehyde (100,000 mt/y), acetic acid (130,000 mt/y), vinyl acetate (80,000 mt/y).

SHOWA DENKO KK

Kawasaki. Feed: propylene. Products: acrylonitrile (51,200 mt/y), ammonia (197,200 mt/y), propylene glycol (10,000 mt/y), propylene oxide (31,000 mt/y).

Ohita. Feed: naphtha. Products: aromatics (160,000 mt/y), butadiene (45,000 mt/y), ethylene (320,000 mt/y), ld polyethylene (70,000 mt/y), hd polyethylene (112,700 mt/y), polypropylene (91,600 mt/y), propylene (170,000 mt/y).

SHUNAN CHEMICAL CL
(Tokuyama Soda CL)

Tokuyama. Feed: ethylene, propylene. Products: ethylene dichloride (130,000 mt/y), propylene oxide (40,000 mt/y).

SUMITOMO CHEMICAL CL

Chiba. Feed: butane, naphtha. Products: benzene (100,000 mt/y), ethylene (345,000 mt/y), ld polyethylene (164,000 mt/y), polypropylene (144,000 mt/y), polyvinyl chloride (52,800 mt/y), propylene (252,000 mt/y), toluene (60,000 mt/y), xylene (40,000 mt/y), SBR (50,000 mt/y), ethylene-propylene rubber (30,000 mt/y).

Niihama. Feed: butane, naphtha. Products: acrylic acid-esters (32,000 mt/y), acrylonitrile (52,000 mt/y), polyvinyl chloride (26,700 mt/y).

SUN ARROW CHEMICAL CL
(Tokuyama Soda CL)

Tokuyama. Feed: ethylene dichloride. Products: polyvinyl chloride (85,000 mt/y), vinyl chloride (180,000 mt/y).

TAKEDA CHEMICAL INDUSTRIES LTD.

Kashima. Feed: benzene. Product: maleic anhydride (16,500 t/y).

Shimizu. Feed: butadiene, styrene maleic anhydride, propylene glycol. Products: polyester (27,500 mt/y), SBR (20,000 mt/y).

TEIJIN HERCULES CHEMICAL CL

Ehime. Feed: paraxylene. Product: dimethyl terephthalate (140,000 mt/y).

Matsuyama. Feed: paraxylene. Product: dimethyl terephthalate (60,000 mt/y),.

Tokuyama. Feed: paraxylene. Product: dimethyl terephthalate (75,000 mt/y).

TEIJIN PETROCHEMICAL INDUSTRIES LTD.

Ehime. Feed: mixed xylenes. Products: orthoxylene (30,000 mt/y), paraxylene (170,000 mt/y).

Tokuyama. Feed: mixed xylene. Products: ethylbenzene (20,000 mt/y), orthoxylene (30,000 mt/y), paraxylene (35,000 mt/y).

TOHO RIKA KOGYO KK

Nagoya. Feed: methanol, orthoxylene. Product: formaldehyde (80,000 mt/y), phthalic anhydride (30,000 mt/y).

TOKUYAMA PETROCHEMICAL CL

Shin-Nanyo. Feed: ethylene. Products: acetaldehyde (100,000 mt/y), butanol (13,000 mt/y).

TOKUYAMA SODA CL

Tokuyama. Feed: propylene. Products: isopropanol (36,000 mt/y), polypropylene (95,000 mt/y).

TOKUYAMA STYRENE MONOMER CL
(jointly owned by idemitsu Petrochemical CL, and Nippon Zeon CL)

Tokuyama. Feed: benzene, ethylene. Product: styrene (91,000 mt/y).

TOMAKOMAI SODA CL
(Nippon Zeon, Hokkaido Soda, Maruzen Petrochemical, Nippon Light Metal, Nissho Iwai, Asahi Denka)

Tomakomai. Feed: ethylene. Product: ethylene dichloride (120,000 mt/y).

TONEN PETROCHEMICAL CL

Kawasaki. Feed: naphtha, LPG. Products: butadiene (105,000 mt/y), butanol (7,700 mt/y), ethylene (350,000 mt/y), hd polyethylene (37,500), propylene (224,000 mt/y), polypropylene (76,000 mt/y).

Wakayama. Feed: reformate. Products: benzene (40,000 mt/y), orthoxylene (65,000 mt/y), paraxylene (73,000 mt/y), toluene (80,000 mt/y).

TORAY INDUSTRIES INC.

Chiba. Feed: acrylonitrile, butadiene, styrene. Products: ABS (55,200 mt/y).

Kawasaki. Feed: benzene, toluene, xylene. Products: benzene (85,000 mt/y), cyclohexane (150,000 mt/y), orthoxylene (100,000 mt/y), paraxylene (200,000 mt/y), xylene mix (39,000 mt/y).

Nagoya. Feed: cyclohexane, paraxylene. Products: caprolactam (130,000 mt/y), nylon (26,400 mt/y), terephthalic acid (100,000 mt/y).

TOUBU BUTADIENE CL
(50% Japan Synthetic Rubber, 50% Sumitomo Chemical)

Chiba. C_4 streams. Product: butadiene (130,000 mt/y).

TOYO CONTINENTAL CARBON LTD.
(subsidiary of Witco Corp.)

Shimonoseki. Feed: heavy aromatic oils. Product: carbon black (15,000 mt/y).

Yokoshiba. Feed: heavy aromatic oils. Product: carbon black (45,000 mt/y).

TOYO SODA MANUFACTURING CL

Tokuyama. Feed: ethylene. Products: ammonia (57,000 mt/y), polyethylene (81,000 mt/y), polyvinyl chloride (12,500 mt/y) vinyl chloride (171,600 mt/y), rubber (20,000 mt/y).

Yokkaichi. Feed: ethylene. Products: polyethylene (86,000 mt/y), polyvinyl chloride (98,000 mt/y), vinyl chloride (127,400 mt/y).

UBE INDUSTRIES LTD.

Ichihara, Chiba. Feed: butadiene, ethylene. Products: polybutadiene (60,000 mt/y), ld polyethylene (101,000 mt/y).

Sakai, Osaka. Feed: benzene, LPG, LNG, naphtha, propylene. Products: ammonia (234,600 mt/y), caprolactam (90,000 mt/y), cyclohexane (100,000 mt/y), polypropylene (105,000 mt/y), urea (95,200 mt/y).

Ube, Yamaguchi. Feed: benzene. Products: caprolactam (90,000 mt/y), cyclohexane (58,000 mt/y), nylon 6 (24,600 mt/y), nylon 66 (2,400 mt/y), nylon 12 (2,400 mt/y).

UKISHIMA AROMATIC CHEMICALS CL
(50% Nippon Petrochemicals CL, 50% Toray Industries Inc.)

Ukishima. Products: cyclohexane (150,000 mt/y), orthoxylene (30,000 mt/y), paraxylene (150,000 mt/y).

UKISHIMA PETROCHEMICALS CL
(50% Nippon Petrochemicals CL, 50% Mitsui Petrochemical Industries)

Chiba and Ukishima. Feed: naphtha. Products: ethylene (808,000 mt/y), propylene (417,000 mt/y).

UNITIKA CHEMICAL CO.

Sakai. Feed: vinyl chloride. Product: polyvinyl alcohol (24,000 mt/y).

YUKA MELAMINE CL

Kashima. Feed: urea. Product: melamine (30,000 mt/y).

ZEON ISOPRENE CL
(Subsidiary of Nippon Zeon)

Mizushima. Feed: C_5 stream, isoprene. Products: isoprene (45,000 mt/y), polyisoprene (37,000 mt/y), C_5 resin.

JORDAN

INTERMEDIATES PETROCHEMICALS INDUSTRIES CL

Zarqa. Feed: glycols, maleic-phthalic anhydrides, oxoalcohols, polyvinyl chloride, styrene. Products: polyesters (8,000 mt/y), plasticizers (4,000 mt/y).

KOREA

DAINONG PETROCHEMICAL INDUSTRY CL
(joint venture Dainong CL, Mitsui Toatsu Chemicals Inc., Toyo Menka Kaisha Ltd.)

Ulsan. Feed: benzene. Product: maleic anydride (12,000 mt/y).

ESOO CHEMICAL CL

Ulsan. Feed: benzene, n-paraffin. Products: alkylbenzene (25,000 mt/y), linear alkylbenzene (30,000 mt/y).

HANKOOK CAPROLACTAM CORP.

Ulsan. Feed: cyclohexane. Product: caprolactam (40,000 mt/y).

HANNAM CHEMICAL CORP.

Ulsan. Feed: acrylonitrile, butadiene, styrene. Product: ABS (20,000 mt/y), polystyrene (135,000 mt/y).

HONAM ETHYLENE CL

Yeo-Chon. Feed: C_4, gas oil, LPG, naphtha. Products: benzene (74,000 mt/y), butadiene—as mixed C_4s (129,000 mt/y), ethylene (350,000 mt/y), propylene (187,000 mt/y), toluene (44,000 mt/y), xylene mix (30,000 mt/y).

KOLON PETROCHEMICAL CL.

Ulsan. Feed: heavy aromatic oil. Product: resins (15,000 mt/y).

KOREA FERTILIZER CL

Ulsan. Feed: naphtha. Products: ammonia (195,000 mt/y), melamine (6,000 mt/y), urea (330,000 mt/y).

KOREA PETROCHEMICAL INDUSTRIES CL

Ulsan. Feed: ethylene, propylene. Products: hd polyethylene (70,000 mt/y), polypropylene (120,000 mt/y).

KOREA PLASTIC INDUSTRY CORP.

Chinhae, Kunsan, Ulsan. Feed: vinyl chloride. Product: polyvinyl chloride (215,000 mt/y), plasticizers (20,000 mt/y).

KOREA POLYOL CL

Ulsan. Feed: propylene oxide. Product: polypropylene glycol (20,000 mt/y).

KOREA SYNTHETIC RUBBER INDUSTRY CL

Ulsan. Feed: butadiene, styrene. Product: SBR (120,000 mt/y).

Yeochun. Feed: C_4, butadiene. Products: butadiene (60,000 mt/y), polybutadiene (30,000 mt/y).

LUCKY ADVANCED MATERIALS INC.
(Licensee of Witco Corp.—Concarb Div.)

Bupyong. Feed: heavy aromatic oil, coal tar distillate. Product: carbon black (30,000 mt/y).

Yosu. Feed: heavy aromatic oil, coal tar distillate. Product: carbon black (65,000 mt/y).y).

LUCKY LTD.

Yeo-Chon. Products: ABS (75,000 mt/y), butanol (10,000 mt/y), oxoalcohols (55,000 mt/y), polyvinyl chloride (200,000 mt/y), plasticizers (36,000 mt/y).

NAMHAE CHEMICAL CORP.

Yosu, Chunnam. Feed: naphtha. Products: ammonia (600,000 mt/y), urea (660,000 mt/y).

SAMKYUNG CHEMICAL CL

Ulsan. Feed: orthoxylene, 2-ethyl hexanol. Product: phthalic anhydride (38,400 mt/y), plasticizers (30,000 mt/y).

TONG SUH PETROCHEMICAL CORP. LTD.

Ulsan. Feed: ammonia, propylene. Product: acrylonitrile (83,000 mt/y).

YONG-NAM CHEMICAL CL

Ulsan. Feed: naphtha. Product: ammonia (310 mt/d), urea (375 mt/d).

YUKONG LTD.

Ulsan. Feed: naphtha. Products: benzene (160,000 mt/y), butadiene (24,000 mt/y), cyclohexane (38,000 mt/y), ethylene (155,000 mt/y), propylene (81,000 mt/y), toluene (210,000 mt/y), xylene mix (330,000 mt/y).

KUWAIT

PETROCHEMICAL INDUSTRIES CO.

Shuaiba. Feed: natural gas. Products: ammonia (3,000 mt/d), urea (2,400 mt/d).

MADAGASCAR

N-REN CORP.

Tamatave. Feed: naphtha. Product: ammonia (175 mt/d).

ZE-REN

Tamatave. Product: urea (90,000 mt/y).

MALAYSIA

BORDEN CHEMICAL

Prai. Feed: phenol, methanol, urea. Products: formaldehyde (15,000 mt/y), resins.

ESSO MALAYA BERHAD

Port Dickson. Feed: refinery gas, naphtha. Product: ammonia (53,000 mt/y).

MALAYSIAN CARBON SDN. BHD.
(Subsidiary of Cabot Corp.)

Port Dickson. Feed: heavy aromatic oil. Product: carbon black.

MEXICO

CELANESE MEXICANA SA

Cangrejera. Products: acetic acid (108,000 mt/y), acetic anhydride (33,000 mt/y), acetone (60,000 mt/y), butanol (16,000 mt/y), butyraldehyde (90,000 mt/y), vinyl acetate (25,000 mt/y).

Celaya. Products: acetic acid (63,000 mt/y), acetic anhydride (31,000 mt/y), acetone (14,000 mt/y), butanol-n (24,000 mt/y), 2-ethyl hexanol (70,000 mt/y), vinyl acetate (25,000 mt/y).

Cosoleacaque. Product: acrylic acid-esters (16,000 mt/y).

Lerma. Products: phthalic anhydride (23,500 mt/y), solvents-plasticizers (10,100 mt/y).

Ocotlan. Products: polyamide (16,860 mt/y), polyester (9,900 mt/y).

Queretaro. Products: polyamide (7,000 mt/y), polyester (69,000 mt/y).

Toluca. Products: polyamide (12,000 mt/y), polyester (23,600 mt/y).

Zacapu. Products: acrylics (10,600 mt/y).

DERIVADOS MALEICOS SA DE CV

Puebla. Feed: benzene. Product: maleic anhydride (7,000 mt/y).

FENOQUIMIA SA
(50-50 Celanese Mexicana and Industrias Resistol)

Cosoleacaque, Ver. Feed: cumene, methanol. Products: acotone (15,000 mt/y), phenol (25,000 mt/y).

FERTILIZANTES MEXICANOS SA

Camargo. Feed: ammonia, CO_2. Product: urea (75,000 mt/y).

Coatzacoalcos (Pajaritos). Feed: ammonia, carbon dioxide. Product: urea (990,000 mt/y)

Minatitlan. Feed: ammonia, carbon dioxide. Product: urea (302,000 mt/y).

Salamanca. Feed: ammonia, carbon dioxide. Product: urea (386,000 mt/y).

GLICOLES MEXICANOS SA DE CV
Apizaco, Tlaxcala. Feed: ethylene oxide. Product: ethylene glycol (100,000 mt/y).

HULES MEXICANOS SA
(owned by Pemex and Polysar Ltd.)

Altamira, Tam. Feed: styrene, butadiene, acn. Product: SBR (45,000 mt/y).

INDUSTRIAS DERIVADAS DEL ETILENO SA

Puebla, Pue. Feed: ethylene oxide, propylene oxide. Product: ethylene glycol (30,000 mt/y), propylene glycol (10,000 mt/y).

INDUSTRIAS RESISTOL SA

Lecheria. Feed: acrylonitrile, butadiene, styrene monomer, vinyl chloride. Products: ABS (11,040 mt/y), polystyrene (13,200 mt/y), polyvinyl chloride (10,000 mt/y), SAN (2,760 mt/y), SBR (6,000 mt/y).

Lerma. Feed: butadiene, methanol, styrene monomer. Products: formaldehyde (32,000 mt/y), SBR (10,500 mt/y).

Xicohtzinco. Feed: butadiene, styrene, vinyl chloride. Products: polystyrene (27,000 mt/y), polyvinyl chloride (35,000 mt/y).

NEGROMEX SA
(owned by Phillips Petroleum and Mexican interests)

Salamanca. Feed: aromatic oils, butadiene, styrene. Products: carbon black (49,600 mt/y), rubber (70,000 mt/y).

PETROCEL SA
Altamira, Tamps. Feed: methanol, paraxylene. Products: dimethyl terephthalate (242,000 mt/y), terephthalic acid (55,000 mt/y).

PETROLEOS MEXICANOS
Atzcapotzalco. Feed: benzene, propylene tet, refinery gas. Products: dodecyclbenzene (15,000 mt/y), propylene (27,000 mt/y), propylene tet (10,900 mt/y).

Cadereyta, N.L. Feed: refinery gas. Product: propylene (45,000 mt/y).

Camargo, Chihuahua. Feed: natural gas. Products: ammonia (132,000 mt/y).

Cangrejera, Veracruz. Feed: air, benzene, ethylene, propylene. Product: acetaldehyde (100,000 mt/y), ethylene oxide (100,000 mt/y), cumene (40,000 mt/y), oxygen (200,000 mt/y).

Ciudad Madero, Tamaulipas. Feed: benzene, butylenes, ethylbenzene, ethylene, propylene, refinery gas. Products: butadiene (55,000 mt/y), dodecyclbenzene (15,000 mt/y), ethylbenzene (39,400 mt/y), ethylene (14,000 mt/y), propylene (61,000 mt/y), propylene tet (10,900 mt/y), styrene (30,000 mt/y).

Cosoleacaque, Veracruz. Feed: natural gas, propylene. Products: acetonitrile (230 mt/y), acrylonitrile (24,000 mt/y), ammonia (2,440,000 mt/y), paraxylene (40,000 mt/y).

Minatitlan, Veracruz. Feed: benzene, ethylene, naphtha, refinery gas. Products: heavy aromatics (7,400 mt/y), benzene (124,250 mt/y), ethylbenzene (17,550 mt/y), meta-para xylene (40,600 mt/y), orthoxylene (11,250 mt/y), toluene (100,000 mt/y).

Pajaritos, Veracruz. Feed: ethylene, dichloroethane. Products: acetaldehyde (44,000 mt/y), dichloroethane (152,690 mt/y), ethylene (209,210 mt/y), ethylene oxide (28,000 mt/y), vinyl chloride (70,000 mt/y).

Poza Rica, Veracruz. Feed: ethane, natural associated gas. Products: ethylene (182,000 mt/y), ld polyethylene (51,000 mt/y), hd polyethylene (100,000 mt/y).

Reynosa, Tamaulipas. Feed: ethane, natural associated gas. Products: ethylene (27,200 mt/y), hd polyethylene (18,000 mt/y).

Salamanca, Guanajuato. Feed: natural gas, propylene. Products: ammonia (391,000 mt/y), isopropanol (15,000 mt/y).

Salina Cruz, Oax. Feed: refinery gas. Product: propylene (45,000 mt/y).

San Martin, Texmelucan, Puebla. Feed: natural gas. Product: methanol (171,500 mt/y).

Tula, Hidalgo. Feed: ammonia, natural gas, propylene. Products: acetonitrile (1,040 mt/y), acrylonitrile (50,000 mt/y)

POLICYD SA
Mexico City and Tampico. Feed: vinyl chloride monomer. Product: polyvinyl chloride (115,000 mt/y).

POLIESTIRENO Y DERIVADOS SA DE CV
Apizaco, Tlaxcala. Product: polystyrene (20,000 mt/y).

POLIMEROS DE MEXICO SA
Moyotzingo, Puebla. Feed: vinyl chloride monomer. Product: polyvinyl chloride (30,000 mt/y).

POLIOLES SA DE CV
(Mexican shareholders and BASF Wyandotte Corp.)

Lerma (State of Mexico). Feed: ethylene oxide, propylene oxide. Products: ethylene glycol, propylene oxide.

POLIVIN SA DE CV
Celaya, Guanajuato. Feed: vinyl acetate. Product: polyvinyl alcohol (2,400 mt/y).

PROMOCIONES INDUSTRIALES MEXICANAS SA DE CV
Altamira, Tamps. Feed: orthoxylene, monovinyl chloride. Products: phthalic anhydride (33,000 mt/y), plasticizers (36,000 mt/y), polyvinyl chloride (125,000 mt/y).

SÍNTESIS ORGÁNICAS SA
Puebla, Pue. Feed: orthoxylene, 2 ethylhexanol. Products: phthalic anhydride (42,000 mt/y), plasticizers (15,000 mt/y).

UNIVEX SA
(DSM affiliate)

Salamanca, Gto. Product: caprolactam (50,000 mt/y).

MOROCCO
SNEP—Societe Nationale d'Electrolyse et de Petrochemie.

Mohammedia. Products: polyvinyl chloride (25,000 mt/y), vinyl acetata (25,000 mt/y).

NETHERLANDS
AKZO ZOUT CHEMIE NEDERLAND BV
Botlek. Feed: ethylene, chlorine, HCl. Product: vinyl chloride (500,000 mt/y).

ARCO CHEMIE NEDERLAND LTD.
(100% Arco Chemical Co.)

Rotterdam. Feed: isobutane and propylene. Product: butanol (150,000 mt/y), isobutylenes (60,000 mt/y), propylene glycol (50,000 mt/y), propylene oxide (180,000 mt/y).

BREDASE POLYSTYREEN MBV.
Breda. Feed: styrene. Product: polystyrene (150,000 mt/y).

CINDU CHEMICALS BV
Uithoorn (near Amsterdam). Feed: coal tar. Products: carbon black feedstock (10,000 mt/y), naphthalene (10,000 mt/y).

DOW CHEMICAL EUROPE
Terneuzen. Products: benzene, butadiene, cumene, ethylene, ethylbenzene, ethylene glycol, ethylene oxide, ld-lld polyethylene, polystyrene, propylene, SB-latex, styrene.

DSM
Chemical Products Division

South Limburg. Products: acetylene (2,200 mt/y), acrylonitrile (160,000 mt/y), caprolactam (230,000 mt/y), melamine (60,000 mt/y).

Chemische Industrie Rijnmond

Botlek. Feed: toluene. Product: phenol (160,000 mt/y).

Methanol Chemie Nederland VoF

Delfzijl and Rotterdam. Products: formaldehyde (120,000 mt/y), resins (200,000 mt/y).

Methanor VoF.

Delfzijl. Product: methanol (720,000 mt/y).

Plastics Division

South Limburg. Feed: C_4, C_5, naphtha, gas oil. Products: benzene (150,000 mt/y), butadiene (110,000 mt/y), ethylene-propylene rubber (50,000 mt/y), ethylene (800,000 mt/y), MTBE (75,000 mt/y), ld polyethylene (370,000 mt/y), hd polyethylene (150,000 mt/y), polypropylene (125,000 mt/y), polyvinyl chloride (180,000 mt/y), propylene (450,000 mt/y), ABS (50,000 mt/y).

HOECHST HOLLAND NV
Vlissingen. Feed: p-xylene, methanol. Product: dimethyl terephthalate (85,000 mt/y).

ICI HOLLAND BV
Rozenburg. Product: polypropylene (100,000 mt/y).

KEMIRA BV
(subsidiary of Kemira Oy)

Rozenburg. Feed: natural gas. Products: ammonia (530,000 mt/y), urea (230,000 mt/y).

NEDERLANDSE STIKSTOF MAATSCHAPPIJ NV
Sluiskil. Feed: natural gas. Products: ammonia (1,250,000 mt/y), urea (730,000 mt/y).

POLYSAR NEDERLAND BV
Arnhem. Feed: acrylonitrile, acrylic monomers, butadiene, styrene, vinyl chloride. Product: acrylic, SBR, PVC, nitrile latexes (60,000 mt/y).

SHELL NEDERLAND CHEMIE BV
Moerdijk. Feed: gas oil, LPG, naphtha. Products: butadiene (115,000 mt/y), ethylbenzene (360,000 mt/y), ethylene (500,000 mt/y), ethylene glycol (130,000 mt/y), ethylene oxide (190,000 mt/y), propylene (300,000 mt/y), propylene oxide (125,000 mt/y), styrene (330,000 mt/y), vinyl esters (30,000 mt/y).

Pernis. Feed: naphtha. Products: acetone (150,000 mt/y), bisphenol A (60,000 mt/y), butanol (85,000 mt/y), butene 1 (40,000 mt/y), isopropanol (240,000 mt/y), higher olefins (60,000 mt/y), isopropanol (290,000 mt/y), MTBE (100,000 mt/y), polypropylene (65,000 mt/y), polyvinyl chloride (200,000 mt/y), propylene (85,000 mt/y), SBR (150,000 mt/y), resins (50,000 mt/y), BR-latex (20,000 mt/y), isoprene rubber (30,000 mt/y).

UNIE VAN KUNSTMESTFABRIEKEN BV
Geleen (Stikstofbindingsbedrijf SBB BV) Feed: natural gas. Products: ammonia (740,000 mt/y—with Carbochimique, Belgium), urea (480,000 mt/y).

Ijmuiden (Mekog BV). Feed: natural gas. Product: ammonia (290,000 mt/y).

Pernis (Ammoniak Unie BV). Feed: natural gas. Product: ammonia (300,000 mt/y—with BASF).

Pernis (Albatros BV). Feed: natural gas. Product: urea (150,000 mt/y).

NEW ZEALAND
PETROCORP
Taranaki, Kapuni. Feed: natural gas. Products: ammonia (270 mt/d), urea (470 mt/d).

Taranaki, Waitara. Feed: natural gas. Product: methanol (1,450).

NICARAGUA
QUÍMICA BORDEN CASA
Tipitapa. Feed: methanol. Product: formaldehyde (6,000 mt/y).

NIGERIA
NIGERIAN NATIONAL PETROLEUM CORP.
Ekpan and Kaduna. Feed: FCC decant oil, ethylene, kerosine, refinery off gas. Products: alkylbenzene (35,000 mt/y), benzene (15,000 mt/y), carbon black (25,000 mt/y), polypropylene (35,000 mt/y).

NORWAY
I/S NORETYL
(51% Norsk Hydro, 49% Statoil)

Rafnes, Bamble. Feed: natural gas liquids. Products: ethylene (350,000 mt/y), propylene (70,000 mt/y).

NORSK HYDRO AS
Porsgrunn. Feed: liquid gas, vinyl chloride. Products: ammonia (560,000 mt/y), polyvinyl chloride (80,000 mt/y), urea (240,000 mt/y).

Rafnes, Bamble. Feed: chlorine, ethylene. Product: ethylene dichloride (500,000 mt/y), vinyl chloride (350,000 mt/y).

NORSK KOKSVERK AS
Mo-i-Rana. Feed: coke oven gas. Products: ammonia (40,000 mt/y), benzene (5,000 mt/y), crude tar (16,000 mt/y).

PAKISTAN

DAWOOD HERCULES CHEMICALS LTD.

Chichoki Mallian. Feed: natural gas. Products: ammonia (625 mt/d), urea (1,100 mt/d).

EXXON CHEMICAL PAKISTAN LTD.

Daharki, Dist. Sukkur. Feed: natural gas. Products: ammonia (145,600 mt/y), urea (249,000 mt/y).

PERU

FERTILIZANTES SINTETICOS SA

Callao. Feed: Bunker 6 fuel oil. Product: ammonia (24,000 mt/y).

PETROPERU
(Licensee of Witco Corp.—Concarb Div.)

Negro de Humo plant, Talara. Feed: heavy aromatic oil. Product: carbon black (15,000 mt/y).

PETROPERU

Talara. Feed: ammonia-carbon dioxide, FCC bottoms, isopropanol, natural gas, propane-propylene. Products: acetone (5,000 mt/y), ammonia (300 mt/d), carbon black (7,700 mt/y), isopropanol (10,650 mt/y), urea (510 mt/d).

PHILIPPINES

COLUMBIAN CARBON PHILIPPINES INC.

Bataan. Feed: heavy aromatic hydrocarbons. Product: furnace carbon black (16,000 mt/y).

LMG CHEMICALS INC.

Batangas. Feed: benzene, dodecene. Product: alkylbenzene (20,000 mt/y).

PORTUGAL

BRESFOR—Industria do Formol Lda.

Gafanha da Nazare. Feed: methanol. Product: formaldehyde (50,000 mt/y).

COMPANHIA INDUSTRIAL DE RESINAS SINTETICAS (CIRES)

Estarreja. Feed: vinyl chloride. Products: polyvinyl chloride-suspension (60,000 mt/y), polyvinyl chloride-emulsion (10,000 mt/y), vinyl chloride (15,000 mt/y).

COMPANHIA NACIONAL DE PETROQUIMICA EP

Sines. Feed: LPG, naphtha. Products: butadiene (42,000 mt/y), ethylene (300,000 mt/y), propylene (140,000 mt/y).

EPSI—Empresa de Polimeros de Sines
(85% CNP, 15% CdF Chimie)

Sines. Feed: ethylene, propylene. Products: ld polyethylene (120,000 mt/y), hd polyethylene (60,000 mt/y), polypropylene (50,000 mt/y).

PETROGAL

Leça da Palmeira. Feed: reformate. Products: benzene (50,000 mt/y), orthoxylene (38,000 m/ty), paraxylene (90,000 mt/y), toluene (140,000 mt/y), xylene mix (10,000 mt/y).

PETROQUÍMICA E GÁS DE PORTUGAL EP

Cabo Ruivo. Feed: alcohol, naphtha, orthoxylene. Products: ammonia (150,000 mt/y), phthalic anhydride (15,000 mt/y), plasticizers (20,000 mt/y).

QUIMIGAL—Química de Portugal EP

Barreiro-Lavradio. Feed: heavy fuel oil. Products: ammonia (290,000 mt/y), urea (80,000 mt/y).

PHILLIPS PARAXYLENE INC.

Guayama. Feed: mixed xylenes. Product: paraxylene (213,000 mt/y).

PHILLIPS PUERTO RICO CORE

Guayama. Feed: naphtha. Products: cyclohexane (263,200 mt/y), orthoxylene (59,000 mt/y).

QATAR

QATAR FERTILIZER CO.
(75% Qatar General Petroleum Corp., 25% Norsk Hydro a.s.)

Umm Said. Feed: natural gas. Products: ammonia (640,000 mt/y), urea (744,000 mt/y).

QATAR PETROCHEMICAL CL.
(84% QPC, 16% CdF Chimie)

Umm Said. Feed: ethane. Products: ethylene (280,000 mt/y), ld polyethylene (170,000 mt/y), propylene (5,000 mt/y).

SAUDI ARABIA

AL-JUBAIL FERTILIZER CO.
(Sabic with Taiwan Fertilizer Co.)

Al-Jubail. Feed: methane. Product: urea (500,000 mt/y).

AL-JUBAIL PETROCHEMICAL CO.
(50% Exxon Chemical Co.)

Al-Jubail. Feed: ethylene. Product: lld polyethylene, hd polyethylene (270,000 mt/y).

ARABIAN PETROCHEMICAL CO.
(100% Sabic)

Al-Jubail. Feed: ethane. Product: ethylene (500,000 mt/y).

EASTERN PETROCHEMICAL CO.
(Sabic, Mitsubishi-led Japanese consortium)

Al Jubail. Feed: ethylene. Products: ethylene glycol 300,000 mt/y, polyethylene (130,000 mt/y).

IBN-SINA NATIONAL METHANOL CO.
(25% Celanese, 25% Texas Eastern)

Al-Jubail. Feed: methane. Product: methanol (700,000 mt/y).

SAUDI ARABIAN FERTILIZER CO.
(Sabic, Safco employees, private Saudi investors)

Al-Dammam. Feed: natural gas. Products: melamine (20,000 mt/y), urea (330,000 mt/y).

SAUDI METHANOL CO.
(Sabic, Mitsubishi-led Japanese consortium)

Al-Jubail. Feed: methane. Product: methanol (600,000 mt/y).

SAUDI PETROCHEMICAL CO.
(50% Pecten Arabian Co.—subsidiary of Shell Oil U.S.)

Al-Jubail. Feed: ethane, benzene. Products: ethanol (281,000 mt/y), ethylene (656,000 mt/y), ethylene dichloride (454,000 mt/y), styrene (295,000 mt/y).

SAUDI YANBU PETROCHEMICAL CO.
(50% Mobil Oil Corp.)

Yanbu. Feed: ethane. Products: ethylene (455,000 mt/y), ethylene glycol (220,000 mt/y), lld polyethylene (296,000 mt/y).

SOUTH AFRICA

AECI LTD.

Midland, Sasolburg. Feed: coal based acetylene, ethylene. Products: acetylene (47,000 mt/y), ethylene dichloride (56,000 mt/y), ld polyethylene (75,000 mt/y), lld polyethylene (75,000 mt/y), polyvinyl chloride (138,000 mt/y), solvents (22,000 mt/y), vinyl chloride (143,000 mt/y).

Modderfontein. Feed: coal. Products: ammonia (1,000 mt/d), methanol (45 mt/d).

FEDMIS
(division of Sentrachem)

Milnerton. Feed: refinery gas. Product: ammonia (85,000 mt/y).

KARBOCHEM PL
(division of Sentrachem)

Sasolburg. Feed: butadiene, styrene. Products: isoprene (50,000 mt/y), polybutadiene (17,500 mt/y), polyisoprene (45,000 mt/y).

NATIONAL CHEMICAL PRODUCTS LTD
(division of Sentrachem)

Germiston and Durban. Feed: molasses, naphthalene, orthoxylene, styrene. Products: acetaldehyde (12,500 mt/y), acetic acid (10,000 mt/y), ethanol (46,000 mt/y), formaldehyde (20,000 mt/y), maleic anhydride (3,000 mt/y), phthalic anhydride (35,000 mt/y), plasticizers (45,000 mt/y), solvents (25,000 mt/y).

POLY RESIN PRODUCTS
(division of Sentrachem)

Germiston. Products: alkyds (1,000 mt/y), polyamide (400 mt/y), polyester (10,000 mt/y).

SAFRIPOL PTY.
(50% Hoechst)

Sasolburg. Feed: ethylene, propylene. Products: hd polyethylene (85,000 mt/y), polypropylene (50,000 mt/y).

SASOL ONE PL

Secunda. Feed: systhesis gas. Products: acetone, ammonia, butanol, ethanol, ethylene, methanol, phenol, styrene.

Sasolburg. Feed: synthesis gas. Products: acetone, ammonia, aromatics mix, butanol, ethanol, methanol, phenol.

STYROCHEM
(division of Sentrachem)

Germiston, Transvaal. Feed: styrene monomer. Product: polystyrene (14,000 mt/y).

SPAIN

AISCONDEL SA

Monzón (Huesca). Feed: acrylonitrile, butadiene, styrene. Products: ABS-SAN (12,000 mt/y), polystyrene rubber (12,000 mt/y), polyvinyl chloride (60,000 mt/y).

Vilaseca (Tarragona). Feed: ethylene, chlorine. Products: ethylene dichloride (240,000 mt/y), polyvinyl chloride (40,000 mt/y), vinyl chloride (150,000 mt/y).

ARRAHONA SA

Prat. Feed: styrene. Product: ABS (8,000 mt/y), polystyrene (50,000 mt/y).

BASF ESPANOLA SA
(wholly owned by BASF)

Tarragona. Feed: acrylates, butadiene, naphtha, orthoxylene, propylene, styrene. Products: butanols (20,000 mt/y), oxoalcohols-2ethylhexanol (28,000 mt/y), phthalic anhydride (16,500 mt/y), polyamide (4,000 mt/y), polystyrene (20,000 mt/y), plasticizers (40,000 mt/y), solvents (6,600 mt/y).

BORDEN ESPANA SA

Axpe-Bilbao. Feed: methanol. Products: formaldehyde (60,000 mt/y).

BRILEN SA

Barbastro. Feed: dimethyl terephthalate, ethylene glycol. Products: methanol (6,000 mt/y), polyester (18,000 mt/y).

CALATRAVA
(100% Empetrol)

Puertollano. Feed: ethylene, mixed C-4 stream. Products: butadiene (32,000 mt/y), hd polyethylene (60,000 mt/y).

Santander. Feed: aromatic oil, butadiene, styrene. Products: carbon black (37,000 mt/y), SBR-PB (82,000 mt/y).

Tarragona. Feed: ethylene, C-4. Products: butadiene (100,000 mt/y), hd polyethylene (60,000 mt/y).

CARBON BLACK ESPAÑOLA SA
(100% Cepsa)

San Roque. Feed: heavy aromatic oils. Product: carbon black (25,000 mt/y).

CEPSA—Compañia Española de Petroleos SA

Luchana (Vizcaya). Feed: naphtha. Products: phthalic anhydride (16,000 mt/y), plasticizers (40,000 mt/y).

San Roque. Feed: naphtha. Products: aromatics mix (20,000 mt/y), benzene (80,000 mt/y), maleic anhydride (13,000 mt/y), orthoxylene (40,000 mt/y), paraxylene (34,000 mt/y), phthalic anhydride (20,000 mt/y), propylene (60,000 mt/y), toluene (130,000 mt/y), xylène mix (120,000 mt/y), solvents (50,000 mt/y).

DOW CHEMICAL IBERICA SA

Bilbao. Products: polystyrene, SB-latex.

Tarragona. Products: benzene, ethylene, hd-ld-lld polyethylene, propylene.

EMPETROL

Puertollano. Feed: naphtha. Products: benzene (80,000 mt/y), butadiene (28,000 mt/y), ethylene (210,000 mt/y), propylene (115,000 mt/y).

La Coruña. Product: propylene (40,000 mt/y).

Tarragona. Feed: LPG, naphtha. Products: butadiene (45,000 mt/y), ethylene (325,000 mt/y), propylene (150,000 mt/y).

ENFERSA—Empresa Nacional de Fertilizantes SA

Avilés, Asturias. Feed: coke gases. Product: ammonia (90,000 mt/y).

Cartagena, Murcia. Feed: naphtha. Products: ammonia (240,000 mt/y), urea (145,000 mt/y).

Puertollano, Ciudad Real. Feed: naphtha. Products: ammonia (180,000 mt/y), urea (110,000 mt/y).

ERTISA

Palos de la Frontera, Huelva. Feed: benzene, propylene. Products: acetone (50,000 mt/y), cumene (120,000 mt/y), phenol (85,000 mt/y).

HISPAVIC INDUSTRIAL SA

Martorell. Feed: vcm. Product: polyvinyl chloride.

Torrelavega. Feed ethylene. Product: polyvinyl chloride, vinyl chloride.

INTERQUISA—Intercontinental Quimica SA

(50% Cepsa, 50% Amoco International)

Algeciras. Feed: methanol, paraxylene. Products: dimethyl terephthalate (100,000 mt/y), terephthalic acid (80,000 mt/y).

MONTORO

(100% EMP)

Puertollano. Feed: benzene, ethylene, propylene. Products: propylene oxide (45,000 mt/y), styrene (100,000 mt/y).

PAULAR

Morell, Tarragona. Product: acrylonitrile (85,000 mt/y).

PETROQUIMICA ESPANOLA SA

(100 % Cepsa)

San Roque (Cádiz). Feed: benzene, heavy naphtha, n-paraffins. Products: alkylbenzene (165,000 mt/y), n-paraffins (165,000 mt/y).

PRODUCTOS QUIMICOS DEL MEDITERRÁNEO SA

El Grao, Castellon de la Plana. Feed: cyclohexane. Product: caprolactam (45,000 mt/y).

RIO RODANO SA

Guturribay, Vizcaya. Feed: butadiene, styrene. Product: SBR latex (12,000 mt/y).

Hernani, Guipúzcoa. Feed: chlorine, normal paraffins, vinyl chloride monomer. Products: polyvinyl chloride (25,000 mt/y), plasticizers (3,000 mt/y).

Miranda de Ebro, Burgos. Feed: glycols, maleic anhydride, oxoalcohols, orthoxylene, vinyl chloride monomer. Products: phthalic anhydride (30,000 mt/y), polyester (22,000 mt/y), polyvinyl chloride (75,000 mt/y), plasticizers (18,000 mt/y).

TARRAGONA QUIMICA SA

(100% Hoechst)

Tarragona. Feed: olefins. Products: hd polyethylene (100,000 mt/y), polypropylene (80,000 mt/y), vinyl acetate (75,000 mt/y).

UNION EXPLOSIVOS RIO TINTO

Guardo. Feed: acetic acid, acetylene, calcium carbide, methanol, vinyl acetate. Products: acetylene (13,000 mt/y), polyvinyl alcohol (1,800 mt/y), vinyl acetate (30,000 mt/y).

Huelva. Feed: ammonia, benzene, naphtha. Products: cyclohexane (80,000 mt/y), ammonia (390,000 mt/y), benzene (120,000 mt/y), urea (237,000 mt/y).

Tarragona. Feed: ethylene, methanol, vinyl acetate. Products: polyvinyl alcohol (6,000 mt/y), vinyl acetate (30,000 mt/y).

VINICLOR SA

Martorell, Barcelona. Feed: ethylene. Product: vinyl chloride (240,000 mt/y).

SRI LANKA

STATE FERTILIZER MANUFACTURING CORP.

Sapugaskanda. Feed: naphtha. Products: ammonia (86,476 mt/y), urea (138,458 mt/y).

SUDAN

N-REN CORP.

Khartoum. Feed: naphtha. Product: ammonia (175 mt/d).

SWEDEN

BEROXO AB

Örnsköldsvik. Feed: butyraldehyde. Product: butanol (30,000 mt/y), oxoalcohols (10,000 mt/y).

Stenungsund. Feed: propylene. Products: butyraldehyde (125,000 mt/y), oxoalcohols (75,000 mt/y), plasticizers (35,000 mt/y).

DOW CHEMICAL

Norrkoeping. Product: SB-latex.

KATALYS AB

(100% Beroxo AB).

Nol. Feed: orthoxylene. Product: phthalic anhydride (17,000 mt/y).

NORSK HYDRO PLAST AB

Stenungsund. Feed: chlorine, ethylene. Products: ethylene dichloride (280,000 mt/y), polyvinyl chloride (100,000 mt/y), vinyl chloride (110,000 mt/y).

PERSTORP AB

Perstorp. Feed: methanol. Products: formaldehyde (200,000 mt/y), melamine, phenol, urea.

STATOIL PETROKEMI AB.

Stenungsund. Feed: gas oil, LPG, naphtha. Products: ethylene (360,000 mt/y), propylene (175,000 mt/y).

SVENSKA POLYSTYREN FABRIKEN AB

Trellerborg. Feed: styrene. Product: polystyrene (40,000 mt/y).

UNIFOS KEMI AB

(Neste Polyethylene)

Stenungsund. Feed: ethylene. Products: ld, hd, md, lld polyethylene (440,000 mt/y).

SWITZERLAND

ICI

Sins. Product: polyvinyl chloride (45,000 mt/y).

LONZA AG

Visp. Feed: LVN-LPG. Products: acetaldehyde, acetic acid, acetic anhydride, acetylene (15,000 mt/y), ammonia (40,000 mt/y), aniline (3,000 mt/y), ethylene (30,000 mt/y), formaldehyde.

SYRIA

GENERAL FERTILIZER CO.

Kattineh-Homs. Feed: naphtha. Products: ammonia (1,000 mt/d), urea (1,050 mt/d).

TRINIDAD

FEDERATION CHEMICALS LTD.

(subsidiary of W.R. Grace & Co.)

Point Lisas. Feed: natural gas. Products: ammonia (231,300 mt/y).

FERTILIZERS OF TRINIDAD & TOBAGO LTD.

Point Lisas. Feed: natural gas. Product: ammonia (1,044 mt/d).

TRINIDAD NITROGEN

(49% W. R. Grace & Co., and Government of Trinidad-Tobago)

Point Lisas. Feed: natural gas. Product: ammonia (370,100 mt/y).

TURKEY

BASF-SUMERBANK TURK KIMYA SANAYII AS

Gebze. Feed: methanol. Product: formaldehyde (30,000 mt/y).

PETKIM PETROKIMYA AS

Aliaga-Izmir. Feed: ammonia, NaCl, naphtha, pyrolysis gasoline. Products: acrylonitrile (70,000), benzene (124,000 mt/y), C_4 (80,000 mt/y), ethylene (300,000 mt/y), ethylene dichloride (7,000 mt/y), ethylene glycol (68,000 mt/y), ethylene oxide (54,000 mt/y), orthoxylene (37,250 mt/y), paraxylene (83,000 mt/y), phthalic anhydride (30,000 mt/y), ld polyethylene (150,000 mt/y), hd polyethylene (40,000 mt/y), polypropylene (60,000 mt/y), polyvinyl chloride (100,000 mt/y), propylene (150,750 mt/y), terephthalic acid (70,000 mt/y), vinyl chloride (105,000 mt/y).

Yarimca-Izmit. Feed: naphtha, NaCl, aromatic oil, benzene, C_4, ammonia, sulfur. Products: alkylbenzene (20,000 mt/y), butadiene (33,000 mt/y), caprolactam (25,000 mt/y), carbon black (30,000 mt/y), ethylene (55,000 mt/y), polybutadiene (13,500 mt/y), ld polyethylene (24,300 mt/y), polystyrene (13,500 mt/y), polyvinyl chloride (46,800 mt/y), propylene (39,600 mt/y), styrene (19,450 mt/y), vinyl chloride (48,600 mt/y), SBR (32,150 mt/y).

SASA

Adana. Feed: methanol, monoethylene glycol, paraxylene. Products: polyester (100,000 mt/y).

UNITED KINGDOM

BORDEN (U.K.) LTD.

Peterlee. Feed: methanol. Products: formaldehyde (36,000 mt/y), resins.

Southampton. Feed: methanol. Products: formaldehyde (23,400 mt/y).

BORDER CHEMICALS LTD.

(100% BP Chemicals)

Grangemouth, Scotland. Feed: propylene, ammonia. Product: acrylonitrile (70,000 t/y).

BP CHEMICALS LTD.

Baglan Bay. Products: benzene concentrate (150,000 mt/y), butadiene (60,000 mt/y), ethanol (155,000 mt/y), ethylene (340,000 mt/y), isopropanol (70,000 mt/y), propylene (200,000 mt/y), styrene (220,000 mt/y), toluene (6,000 mt/y), vinyl acetate (80,000 mt/y).

Carshalton. Products: solvents and plasticizers (15,000 mt/y).

Barry. Product: resins (40,000 mt/y).

Grangemouth. Products: acetone (25,000 mt/y), benzene (250,000 mt/y), butadiene (48,000 mt/y), ethanol (155,000 mt/y), ethylene (250,000 mt/y), polybutylenes (48,000 mt/y), hd polyethylene (130,000 mt/y), propylene (180,000 mt/y).

Hull. Products: acetic acid (350,000 mt/y), acetone (46,000 mt/y), ethanol (25,000 mt/y), phthalic anhydride (70,000 mt/y).

Wilton. Products: butadiene (90,000 mt/y), ethylene (350,000 mt/y), ld polyethylene (70,000 mt/y), propylene (60,000 mt/y).

CIBA-GEIGY LTD.

Duxford, Cambridge. Feed: methanol. Product: formaldehyde (120,000 mt/y).

CONOCO LTD.

South Killingholme, Humberside. Feed: reformate. Product: benzene (110,000 mt/y).

DOW CHEMICAL

Barry. Product: polystyrene.

ENICHEM ELASTOMERS LTD.

Grangemouth, Scotland. Feed: butadiene, styrene, ethylene, propylene. Products: polybutadiene (45,000 mt/y), polypropylene (5,000 mt/y), SBR (30,000 mt/y), block-SBR (15,000 m/ty), ethylene-propylene rubber (15,000 mt/y).

Hythe, Hampshire. Feed: acrylonitrile, butadiene, ethylbenzene. Product: rubber (150,000 mt/y).

ESSO CHEMICAL LTD.

Fawley. Feed: petroleum fractions. Products: higher olefins (200,000 mt/y), butyl-halobutyl rubber (50,000 mt/y).

ESSOCHEM OLEFINS INC.

Fawley. Feed: petroleum fractions. Products: butadiene (80,000 mt/y), ethylene (105,000 mt/y), isobutylene (60,000 mt/y), propylene (100,000 mt/y).

Mossmorran, Fife. Feed: ethane. Product: ethylene (500,000 mt/y).

IMPERIAL CHEMICAL INDUSTRIES LTD.

Barry. Product: polyvinyl chloride (90,000 mt/y).

Billingham. Products: acrylics, acetone (50,000 mt/y), nylons, oxoalcohols (250,000 mt/y), phenol (80,000 mt/y), solvents.

Caster-Kellner, Runcorn. Product: polyvinyl chloride (112,000 mt/y).

Hillhouse, Lancashire. Product: polyvinyl chloride (135,000 mt/y).

North Tees. Products: aromatics-benzene (400,000 mt/y), cumene, cyclohexane, ethylbenzene, toluene, mixed xylenes (200,000 mt/y).

Wilton. Products: butadiene, ethylene, ethylene glycols (85,000 mt/y), ethylene oxide (240,000 mt/y), nylon 66, paraxylene, polypropylene (200,000 mt/y), propylene, terephthalic acid (450,000), solvents, plasticizers, resins.

SEVALCO LTD.

(50% Columbian Chemicals, 50% Phillips Petroleum)

Avonmouth, Bristol. Feed: heavy aromatic oils. Product: furnace and thermal carbon black (70,000 mt/y).

SHELL CHEMICALS U.K. LTD.

Carrington. Feed: ethylene, ethylene oxide, propylene, propylene oxide, styrene. Products: ld polyethylene (105,000 mt/y), polypropylene (110,000 mt/y), polystyrene (50,000 mt/y).

Shell Haven. Feed: benzene. Product: alkylbenzene (120,000 mt/y).

Stanlow. Feed: refinery gases. Products: acetone, benzene (400,000 mt/y), butanol, butylenes, isopropanol, oxoalcohols (100,000 mt/y), propylene (40,000 mt/y), higher olefins (170,000 mt/y).

UKF FERTILIZERS LTD.

Ince, Chester. Feed: natural gas. Products: ammonia (300,000 mt/y).

UNITED STATES

AGRICO CHEMICAL CO.

(one of the Williams Companies)

Blytheville, Ark. Feed: natural gas. Products: ammonia (320,000 mt/y), urea (300,000 mt/y).

Donaldsonville, La. Feed: natural gas. Products: ammonia (385,000 mt/y), urea (180,000 mt/y).

Fort Madison, Iowa. Feed: natural gas. Product: ammonia (310,000 mt/y).

Verdigris, Okla. Feed: natural gas. Products: ammonia (770,000 mt/y), urea (370,000 mt/y)

AIR PRODUCTS AND CHEMICALS INC.

Calvert City, Ky. Feed: vinyl acetate, vinyl chloride. Products: acetic acid (54,545 mt/y), polyvinyl alcohol (52,272 mt/y), polyvinyl chloride (136,116 mt/y).

New Orleans, La. Feed: natural gas. Product: ammonia (280,000 mt/y).

Pensacola, Fla. Feed: ammonia, natural gas, vinyl chloride. Products: ammonia (94,000 mt/y), methanol (180,000 mt/y), polyvinyl chloride (90,700 mt/y), urea (28,000 mt/y).

ALLIED CORP.

Baton Rouge, La. Product: hd polyethylene (363,000 mt/y).

Chesterfield, Va. and Columbia, S.C. Product: nylons (268,000 mt/y).

Geismar, La. Feed: ethane, propane. Products: butadiene (16,000 mt/y), ethylene (325,000 mt/y), propylene (21,000 mt/y).

Hopewell, Va. Product: ammonia (318,000 mt/y), caprolactam (249,000 mt/y).

Moncure, N.C. Product: polyester (54,000 mt/y).

Philadelphia. Products: acetone (147,000 mt/y), phenol (240,000 mt/y).

AMERICAN CYNAMID CO.

Fortier, La. Feed: natural gas, propylene. Products: acrylonitrile (122,470 mt/y), ammonia (610,000 mt/y), melamine (31,750 mt/y).

AMERICAN HOECHST CORP.

Pasadena, Tex. Feed: benzene, ethylene. Product: high molecular weight hd polyethylene (220 million t/y), styrene (408,000 mt/y).

Spartanburg, S.C. Feed: DMT, TPA, glycol. Product: polyester (200,000 mt/y).

AMOCO CHEMICALS CORP.

Cedar Bayou, Tex. Feed: propylene. Product: polypropylene (190,000 mt/y).

Chocolate Bayou, Tex. Feed: ethane, ethylene, naphtha, propane, propylene. Products: aromatics (85,000 mt/y), butadiene (91,000 mt/y), ethylene (975,000 mt/y), hd polyethylene (168,000 mt/y), polypropylene (292,000 mt/y), propylene (390,000 mt/y).

Cooper River, S.C. Feed: paraxylene. Product: terephthalic acid (612,400 mt/y).

Decatur, Ala. Feed: paraxylene, xylene. Products: paraxylene (454,000 mt/y), terephthalic acid (653,000 mt/y).

Joliet, Ill. Feed: butane, metaxylene, styrene. Products: isophthalic acid (73,000 mt/y), maleic anhydride, polystyrene (94,000 mt/y).

Texas City, Tex. Feed: aromatics, benzene, butylenes, ethylene, propylene, xylene. Products: metaxylene, (110,000 mt/y), paraxylene (550,000 mt/y), polyisobutylene (112,000 mt/y), propylene (230,000 mt/y), solvents (162,000 mt/y), styrene (340,000 mt/y).

Torrance, Calif. Feed: styrene. Product: polystyrene (13,000 mt/y).

Whiting, Ind. Feed: butylenes, methanol. Product: MTBE (117,000 mt/y), polyisobutylene (75,000 mt/y).

Willow Springs, Ill. Feed: styrene. Products: polystyrene (31,000 mt/y).

AMOCO OIL CO.

Texas City, Tex. Feed: crude oil. Products: benzene (352,000 mt/y), toluene (895,000 mt/y), xylene mix (645,000 mt/y).

Whiting, Ind. Feed: crude oil. Products: propylene (110,000 mt/y), xylene mix (602,000 mt/y).

ASHLAND CHEMICAL CO.

Catlettsburg, Ky. Feed: crude oil, coal tar light oil. Products: aromatics mix (30 mt/d), cumene (500 mt/d), toluene (280 mt/d), xylene mix (210 mt/d), solvents (600 mt/d).

Neal, W. Va. Feed: n-butane. Product: maleic anhydride (22,686 mt/y).

CARBON BLACK PLANTS:

Aransas Pass, Tex. 81,500 mt/y.
Belpre, Ohio 54,500 mt/y.
Ivanhoe, La. 129,000 mt/y.

ATLANTIC RICHFIELD CO.

Bayport, Tex. Feed: isobutane, propylene. Products: acetone (25,400 mt/y), propylene (107,800 mt/y), propylene glycol (507,240 mt/y).

Beaver Valley, Pa. Feed: styrene. Products: polystyrene (228,700 mt/y), styrene (101,000 mt/y).

Port Arthur, Tex. Feed: chlorine, ethylene. Products: ethylene dichloride (225,000 mt/y).

ATLAS POWDER CO.

(subsidiary of Tyler Corp.)

Joplin, Mo. Feed: natural gas. Products: ammonia (355 mt/d), urea (195 mt/d).

BASF CORP.

Chemicals Division.

Freeport, Tex. Feed: cyclohexane, natural gas, propylene. Products: acrylic acid-esters (170,000 mt/y), caprolactam (160,000 mt/y), nylons (105,000 mt/y), oxoalcohols (100,000 mt/y), solvents (16,000 mt/y).

Geismar, La. Feed: ethylene. Product: ethylene glycol (160,000 mt/y), ethylene dichloride, ethylene oxide (215,000 mt/y).

Jamesburg, N.J. Feed: styrene. Product: expandable polystyrene (80,000 mt/y).

Kearny, N.J. Feed: orthoxylene, oxoalcohols. Products: phthalic anhydride (80,000 mt/y), plasticizers (110,000 mt/y).

BISON NITROGEN PRODUCTS CO.

(65% Terra International 35% W. R. Grace).

Woodward, Okla. Feed: ammonia, carbon dioxide. Product: urea (305 mt/d).

BORDEN CHEMICAL CO.

Chemical Division

Demopolis, Ala. Feed: methanol. Product: formaldehyde (30,657 mt/y).

Diboll, Tex. Feed: methanol. Product: formaldehyde (43,533 mt/y).

Fayetteville, N.C. Feed: methanol. Product: formaldehyde (101,167 mt/y).

Fremont, Calif. Feed: methanol. Product: formaldehyde (70,511 mt/y).

Geismar, La. Feed: methanol, natural gas. Products: acetic acid (63,500 mt/y), acetylene (46,200 mt/y), ammonia (360,000 mt/y), formaldehyde (115,270 mt/y), methanol (541,300 mt/y), urea (192,700 mt/y), vinyl acetate (63,000 mt/y), vinyl chloride (300,000 mt/y).

Illiopolis, Ill. Feed: vinyl chloride, vinyl acetate. Product: vinyl chloride (280,000 mt/y).

Kent, Wash. Feed: methanol. Product: formaldehyde (36,768 mt/y).

La Grange, Ore. Feed: methanol. Product: formaldehyde (28,817 mt/y).

Louisville, Ky. Feed: methanol. Product: formaldehyde (43,533 mt/y).

Missoula, Mont. Feed: methanol. Product: formaldehyde (45,598 mt/y).

Sheboygan, Wisc. Feed: methanol. Product: formaldehyde (70,511 mt/y).

Springfield, Ore. Feed: methanol. Product: formaldehyde (109,138 mt/y).

BORG-WARNER CHEMICALS

North American plants. Product: ABS (362,874 mt/y).

Carville, La. (with Cosden Oil & Chemical). Feed: benzene, ethylene. Products: styrene (340,195 mt/y), toluene (17,000 mt/y).

Geismar, La. (with Allied Chemicals and BASF Wyandotte). Feed: ethane, propane. Products: butadiene (2,722 mt/y), ethylene (54,431 mt/y), propylene (2,558 mt/y). Note: Borg-Warner share only on all plants. (Ethylene shares: UTP and BASF).

CABOT CORP.

Pampa, Tex.; Franklin and Ville Platte, La.; and Waverly, W. Va. Feed: gas and petroleum fractions. Product: carbon blacks (furnace process and thermal) (440,000 mt/y).

CELANESE CHEMICAL CO.

Bay City, Tex. Feed: ethylene, propylene. Product: butanol (113,000 mt/y), butaraldehyde (113,000 mt/y), vinyl acetate (216,000 mt/y).

Bishop, Tex. Feed: natural gas. Products: formaldehyde (818,000 mt/y), methanol (393,000 mt/y).

Clear Lake, Tex. Feed: natural gas, ethylene. Products: acetic acid (409,000 mt/y), acrylic acid-esters (136,000 mt/y), ethylene glycol (227,000), ethylene oxide (205,000 mt/y), vinyl acetate (200,000 mt/y).

Newark, N.J. Feed: methanol. Product: formaldehyde (55,000 mt/y).

Pampa, Tex. Feed: butane. Product: acetic acid (250,000 mt/y), acetic anhydride.

Rock Hill, S.C. Feed: methanol. Product: formaldehyde (55,000 mt/y).

CERTAINTEED CORP.
Lake Charles, La. Feed: vinyl chloride monomer. Product: polyvinyl chloride (100,000 mt/y).

CF INDUSTRIES INC.
Donaldsonville, La. Feed: natural gas. Products: ammonia (1,500,000 mt/y), urea (900,000 mt/y).
Terre Haute, Ind. Feed: natural gas. Product: ammonia (130,000 mt/y).

CHAMPLIN PETROLEUM CO.
Corpus Christi, Tex. Feed: crude oil. Products: benzene (62,000 mt/y), cumene (200,000 mt/y), cyclohexane (73,000 mt/y), toluene (110,000 mt/y), xylene mix (15,000 mt/y).

CHARTER INTERNATIONAL OIL CO.
Houston, Tex. Feed: Crude and intermediate petroleum feedstocks. Products: propylene (151,240 mt/y).

CHEMBOND CORP.
(subsidiary of Texaco Oil Co.)
Andalusia, Ala. Feed: methanol. Product: formaldehyde (45,000 mt/y).
Moncure, N.C. Feed: methanol. Product: formaldehyde (55,000 mt/y).
Springfield, Ore. Feed: methanol. Product: formaldehyde (73,000 mt/y).
Winnfield, La. Feed: methanol. Product: formaldehyde (45,000 mt/y)

CHEVRON CHEMICAL CO.
(subsidiary of Standard Oil Co. of California)
Baytown, Tex. Feed: distillate, LPG, ethylene, naphtha. Products: alphaolefins (107,700 mt/y), ethylene (730,000 mt/y), butadiene (190,000 mt/y), ld polyethylene (272,000 mt/y), propylene (355,700 mt/y).
El Segundo, Calif. Feed: petroleum base stocks. Product: benzene (77,000 mt/y).
Marietta, Ohio. Feed: styrene. Product: polystyrene (200,000 mt/y).
Orange, Tex. Feed: ethylene. Product: ld polyethylene (397,000 mt/y), hd polyethylene (261,000 mt/y), ld polyethylene (136,000 mt/y).
Pascagoula, Miss. Feed: petroleum base stocks. Product: paraxylene (227,000 mt/y).
Philadelphia, Pa. Feed: benzene, propylene, reformate, toluene. Products: benzene (127,000 mt/y), cumene (204,000 mt/y), toluene (102,000 mt/y).
Port Arthur, Tex. Feed: petroleum base stocks. Products: benzene (360,000 mt/y), butadiene (22,000 mt/y), cumene (204,000 mt/y), cyclohexane (112,000 mt/y), ethylene (432,000 mt/y), propylene (175,000 mt/y).
Richmond, Calif. Feed: petroleum base stocks. Products: alkylbenzene (150,000 mt/y).
St. James, La. Feed: benzene, ethylene. Product: styrene (272,000 mt/y), toluene (23,000 mt/y).

CITGO PETROLEUM CORP.
(subsidiary of Southland Corp.)
Lake Charles, La. Feed: crude. Products: benzene (280 mt/d), propylene (334 mt/d).

COASTAL REFINING & MARKETING INC.
Corpus Christi, Tex. Feed: crude oil. Products: benzene (246,000 mt/y), xylene mix (77,000 mt/y).

COLUMBIA NITROGEN CORP.
(NV DSM subsidiary).
Augusta, Ga. Feed: natural gas. Products: ammonia (500,000 mt/y), urea (360,000 mt/y).

COLUMBIAN CHEMICALS CO.
El Dorado, Ark., Franklin, La., Mojave, Calif., Moundsville, W. Va., Ulysses, Kans. Feed: heavy aromatic hydrocarbons. Product: carbon black (293,000 mt/y).

COMINCO AMERICAN INC.
Borger, Tex. Feed: natural gas. Products: ammonia (325,000 mt/y), urea (70,000 mt/y).

CONCARB DIVISION, WITCO CORP.
Phenix City, Ala. Feed: heavy aromatic oil. Product: carbon black (25,000 mt/y).
Ponca City, Okla. Feed: heavy aromatic oil. Product: carbon black (59,000 mt/y).
Sunray, Tex. Feed: heavy aromatic oil. Product: carbon black (45,400 mt/y).

COOPERATIVE FARM CHEMICALS ASSOCIATION
Lawrence, Kan. Feed: natural gas. Products: ammonia (1,040 mt/d), urea (680 mt/d).

COPOLYMER RUBBER & CHEMICAL CORP.
Addis, La. Feed: petroleum derivative. Product: ethylene-propylene rubber (40,000 mt/y).
Baton Rouge, La. Feed: petroleum derivatives. Products: styrene-butadiene rubber (190,000 mt/y).

CORPUS CHRISTI PETROCHEMICAL CO.
(37.5% Champlin, 37.5% ICI, 25% Soltex)
Corpus Christi, Tex. Feed: gas oil, LPG, naphtha, toluene. Products: benzene (196,000 mt/y), butanes (185,000 mt/y), ethylene (545,000 mt/y), propylene (256,000 mt/y).

CPEX PACIFIC INC.
St. Helens, Oregon. Feed: natural gas. Products: ammonia (227 mt/d), urea (295 mt/d).

CROWN CENTRAL PETROLEUM CORP.
Pasadena, Tex. Feed: crude oil. Products: benzene (70,000 mt/y), propylene (33,000 mt/y), toluene (35,000 mt/y), xylene (35,000 mt/y).

DIAMOND SHAMROCK CORP.
Deer Park, Tex. Feed: chlorine, ethylene. Products: ethylene dichloride (495 mt/d).
Sunray, Tex. Feed: natural gas. Product: ammonia (400 mt/d).

DIVERSITECH GENERAL
(A GenCorp Co.)
Mogadore, Ohio. Feed: butadiene, styrene, vinyl pyridine. Product: SB-latices (63,500 mt/y).

DIXIE CHEMICAL CO.
Bayport, Tex. Product: acrylics (4,500 mt/y).

DOW CHEMICAL
Freeport, Tex. Products: acetylene (4,000 mt/y), acrylonitrile-butadiene-styrene (136,000 mt/y), ammonia (47,000 mt/y), benzene (23,000 mt/y), bisphenol A (77,000 mt/y), butadiene (39,000 mt/y), ethylbenzene (795,000 mt/y), ethylene (1,136,000 mt/y), ethyl chloride (35,000 mt/y), ethylene dichloride (727,000 mt/y), ethylene glycol (115,000 mt/y), ethylene oxide (130,000 mt/y), phenol (211,000 mt/y), hd polyethylene (75,000 mt/y), ld polyethylene (400,000 mt/y), propylene (250,000 mt/y), propylene glycol (114,000 mt/y), propylene oxide (435,000 mt/y), styrene (681,000 mt/y).
Ironton, Ohio. Products: acrylonitrile (29,000 mt/y), polystyrene.
Oyster Creek (Freeport), Tex. Products: acetone (127,000 mt/y), ethylene dichloride (500,000 mt/y), vinyl chloride (350,000 mt/y).
Plaquemine, La. Products: ethylene (682,000 mt/y), ethylene dichloride (900,000 mt/y), ethylene glycol (204,000 mt/y), ethylene oxide (206,000 mt/y), hd polyethylene (120,000 mt/y), ld polyethylene (350,000 mt/y), propylene (75,000 mt/y), propylene glycol (68,000 mt/y), propylene oxide (200,000 mt/y), plasticizers (54,000 mt/y).
Torrance, Calif. Products: acrylonitrile (34,000 mt/y), polystyrene (453,000 mt/y).

EASTMAN CHEMICAL PRODUCTS INC.
Longview, Tex. Feed: propane, ethane. Products: acetaldehyde (215,000 mt/y), ethanol, ethylene, ethylene oxide, oxoalcohols, polyethylene (280,000 mt/y), polypropylene (65,000 mt/y), propylene, solvents.

EL PASO PRODUCTS CO.
Bayport, Tex. Feed: propylene. Product: polypropylene (110,000 mt/y).

Corpus Christi, Tex. Feed: BBC. Product: butadiene (95,000 mt/y).
Odessa, Tex. Feed: benzene, ethane, propane. Products: butadiene (4,000 mt/y), ethylene (236,000 mt/y), ld polyethylene (182,000 mt/y), polypropylene (55,000 mt/y), propylene (65,000 mt/y), styrene (136,000 mt/y).

ETHYL CORP.
Orangeburg, S.C. Feed: ethylene. Product: alkylbenzene.
Pasadena, Tex. Feed: ethylene. Product: alphaolefins, ethylchloride, ethylene dichloride.

EXXON CHEMICAL AMERICAS
Baton Rouge, La. Feed: petroleum intermediates. Products: benzene, butadiene, butylenes, carbon black feedstocks, ethylene, isoparaffins, isoprene, isopropanol, oxoalcohols, phthalic anhydride, ld polyethylene, propylene, vinyl acetate, plasticizers, resins, butyl rubber, ep rubber, solvents.
Baytown, Tex. Feed: petroleum intermediates. Products: benzene, butadiene, butene 1, ethylene, isobutylene, MTBE, orthoxylene, paraffins, paraxylene, propylene, polypropylene, polyisobutylene, propylene, butyl rubber.
Bayway, N.J. Feed: petroleum intermediates. Products: polyisobutylene, propylene, solvents.
Mont Belvieu, Tex. Products: linear ld polyethylene, hd polyethylene.

FARMLAND INDUSTRIES INC.
Dodge City, Kan. Feed: natural gas. Product: ammonia (590 mt/d).
Enid, Okla. Feed: natural gas. Product: ammonia (2,280 mt/d), urea (900 mt/d).
Fort Dodge, Iowa. Feed: natural gas. Product: ammonia (570 mt/d).
Hastings, Neb, Feed: natural gas. Product: ammonia (410 mt/d).
Pollock, La. Feed: natural gas. Product: ammonia (1,140 mt/d).

FINA OIL & CHEMICAL CO.
Big Spring, Tex. Feed: crude oil. Products: polyisobutylene (16,500 mt/y), polypropylene (34,800 mt/y), polystyrene (20,000 mt/y).
Calumet City, Ill. Feed: styrene. Product: polystyrene (83,800 mt/y).
Carville, La. Feed: benzene, ethylene. Product: styrene (294,800 mt/y).
Groves, Tex. Feed: LPG. Product: ethylene (9,000 mt/y), propylene (60,000 mt/y).
LaPorte, Tex. Feed: ethylene, propylene. Product: polypropylene (205,000 mt/y).
Port Arthur, Tex. Feed: crude oil. Products: benzene (660 mt/y), toluene (1,160 mt/y), xylene mix (990 mt/y).
Windsor, N.J. Feed: styrene. Product: polystyrene (53,300 mt/y).

FIRESTONE SYNTHETIC RUBBER & LATEX CO.
Lake Charles, La. Feed: butadiene, styrene. Product: SBR (120,000 mt/y).
Orange, Tex. Feed: butadiene. Products: polybutadiene/SBR (110,000 mt/y).

GENERAL TIRE INC.
(A GenCorp Co.)
Odessa, Tex. Feed: butadiene, styrene. Product: SBR (99,793 mt/y).

GEORGIA GULF CORP.
Bound Brook, N.J. Feed: cumene. Products: acetone (43,000 mt/y), phenol (71,200 mt/y).
Delaware City, Del. Feed: vinyl chloride. Products: polyvinyl chloride (68,200 mt/y).
Houston, Tex. Feed: benzene, propylene. Product: cumene (400,000 mt/y).
Plaquemine, La. Feed: chlorine, cumene, ethylene, hydrogen, natural gas, vcm. Products: acetone (90,400 mt/y), ammonia (181,500 mt/y), methanol (379,000 mt/y), phenol (149,700 mt/y), polyvinyl chloride (317,600 mt/y), vinyl chloride (454,500 mt/y).

GEORGIA-PACIFIC CORP.

Albany, Oregon. Feed: methanol. Product: formaldehyde (54,446 mt/y).

Bellingham, Wash. Feed: pulp mill liquor. Product: ethanol (18,000 mt/y).

Columbus, Ohio. Feed: methanol. Product: formaldehyde (77,133 mt/y).

Conway, N.C. Feed: methanol. Product: formaldehyde (47,641 mt/y).

Crossett, Ark. Feed: methanol. Product: formaldehyde (72,596 mt/y).

Lufkin, Tex. Feed: methanol. Product: formaldehyde (45,372 mt/y).

Russellville, S.C. Feed: methanol. Product: formaldehyde (99,819 mt/y).

Taylorsville, Miss. Feed: methanol. Product: formaldehyde (54,446 mt/y).

Vienna, Ga. Feed: methanol. Product: formaldehyde (45,372 mt/y).

B.F. GOODRICH CHEMICAL GROUP

Avon Lake, Ohio, Calvert City and Louisville, Ky., Deer Park and LaPorte, Tex., Long Beach, Calif., Pedricktown, N.J., Plaquemine, La., Terre Haute, Ind. Products: vinyl chloride monomer and viny resins.

ENRON CORP.

Clinton, Iowa. Feed: ethane, propane. Products: butadiene (17,306 mt/y), ethylene (364,569 mt/y), ld polyethylene (188,913 mt/y), hd polyethylene (157,428 mt/y), propylene (13,872 mt/y).

Morris, Ill. Feed: ethane, propane. Products: butadiene (14,500 mt/y), ethylene (430,000 mt/y), ethylene glycol (106,000 mt/y), ethylene oxide (40,900 mt/y), ld polyethylene (370,000 mt/y), polypropylene (110,000 mt/y), propylene (110,000 mt/y).

GOODYEAR TIRE & RUBBER CO.

Beaumont, Tex. Feed: C-5 streams, butadiene. Products: isoprene (81,600 mt/y), polyisoprene (60,000 mt/y), polybutadiene (165,000 mt/y).

Calhoun, Ga. Feed: butadiene, styrene. Product: SBR (41,000 mt/y).

Houston, Tex. Feed: acrylonitrile, butadiene-styrene. Products: acrylonitrile-butadiene rubber (14,000 mt/y), styrene-butadiene rubber (310,000 mt/y).

Niagara Falls, N.Y. Feed: vinyl chloride monomer. Product: polyvinyl chloride (54,000 mt/y).

Point Pleasant, W. Va. Feed: tpa, ethylene glycol. Product: polyester (154,000 mt/y).

W.R. GRACE & CO.

Memphis, Tenn. Feed: natural gas. Products: ammonia (308,400 mt/y), urea (349,300 mt/y).

GREEN VALLEY CHEMICAL CORP.

Creston, Iowa. Feed: natural gas. Product: ammonia (100 mt/d).

HAWKEYE CHEMICAL CO.

Clinton, Iowa. Feed: natural gas and hydrogen. Products: ammonia (200,000 mt/y), urea (60,000 mt/y).

HERCOFINA

(joint venture Hercules Inc. and American Petrofina)

Wilmington, N.C. Feed: paraxylene, methanol, Products: dimethyl terephthalate (640,000 mt/y), terephthalic acid (140,000 mt/y).

HERCULES INC.

Louisiana, Mo. Feed: natural gas. Product: formaldehyde (80,000 mt/y).

HIMONT USA INC.

Bayport, Tex. Feed: propylene. Product: polypropylene (225,000 mt/y).

Lake Charles, La. Feed: propylene. Product: polypropylene (360,000 mt/y).

J.M. HUBER CORP.

Baytown, Tex. Feed: refinery bottoms. Product: carbon black (318 mt/d).

Borger, Tex. Feed: refinery bottoms. Product: carbon black (235 mt/d).

ICI AMERICAS

Bayport, Tex. Feed: acetic acid, ammonia, butanol, ethanol, ethylene, methanol. Products: ethylene glycol (240,000 mt/y), ethylene oxide (235,000 mt/y), glycol ethers (40,000 mt/y), ethanolamines (18,000 mt/y), glycol ether acetates (14,000 mt/y).

INTERNATIONAL MINERALS & CHEMICAL CORP.

Sterlington, La. Feed: natural gas. Product: ammonia (840,000 mt/y).

KOPPERS CI

Bridgeville, Pa. Product: polyester.

Chicago, Ill. Feed: naphthalene, orthoxylene. Products: phthalic anhydride (57,000 mt/y), polyester.

Follansbee, W. Va. Feed: coal tar. Product: naphthalene (70,000 mt/y).

Oxnard, Calif. Product: polyester.

Richmond, Calif. Product: polyester.

LYONDELL PETROCHEMICAL CO.

(wholly owned by Atlantic Richfield Co.)

Channelview, Tex. Feed: ethane, gas oils, naphthas, mixed C_4's, natural gas, propane. Products: butadiene (200,000 mt/y), butylenes (170,000 mt/y), ethylbenzene (612,250 mt/y), ethylene (1,270,000 mt/y), isoprene (45,000 mt/y), isopropanol (25,900 mt/y), methanol (600,000 mt/y), polybutadiene (8,150 mt/y), propylene (725,000 mt/y), propylene oxide (235,500 mt/y), styrene (542,200 mt/y).

Houston, Tex. Feed: refinery feeds. Products: benzene (170,000 mt/y), orthoxylene (110,000 mt/y), paraxylene (175,000), toluene (100,000 mt/y).

MARATHON OIL CO.

Detroit, Mich. Feed: refinery. Product: propylene (58,000 mt/y).

Robinson, Ill. Feed: refinery gas. Product: propylene (50,000 mt/y).

Texas City, Tex. Feed: refinery. Products: aromatics mix (15,000 mt/y), benzene (20,000 mt/y), propylene (60,800 mt/y), toluene (75,000 mt/y), xylene mix (48,400 mt/y).

MELAMINE CHEMICALS INC.

Donaldsonville, la. Feed: urea. Product: melamine (32,000 mt/y).

MISSISSIPPI CHEMICAL CORP.

Yazoo City, Miss. Feed: natural gas. Product: ammonia (1,000 mt/d), urea (460 mt/d).

MOBIL CHEMICAL CO.

(division of Mobil Oil Corp.)

Beaumont, Tex. Feed: natural gas liquids, reformate. Products: benzene (167,000 mt/y), butadiene (35,000 mt/y), butylenes (32,000 mt/y), ethylene (410,000 mt/y), ld polyethylene (150,000 mt/y), propylene (110,000 mt/y), toluene (297,000 mt/y).

Holyoke, Mass. Feed: styrene. Products: polystyrene (40,800 mt/y).

Joliet, Ill. Feed: styrene. Product: polystyrene (18,140 mt/y).

Santa Ana, Calif. Feed: styrene. Product: polystyrene (29,480 mt/y).

MONSANTO

Addyston, Ohio; Decatur, Ala; Springfield, Mass. Product: polystyrene (317,518 mt/y).

Addyston, Ohio; Muscatine, Iowa. Product: ABS (228,000 mt/y).

Alvin, Tex. Feed: propylene. Product: acrylonitrile (210,000 mt/y).

Luling, La. Feed: natural gas. Product: ammonia (210,000 mt/y).

Pensacola, Fla. Feed: butane. Product: maleic anhydride (58,968 mt/y).

St. Louis, Mo. Feed: butane. Product: maleic anhydride (18,144 mt/y).

NIPRO INC.

(NV DSM subsidiary)

Augusta, Ga. Feed: cyclohexane. Product: caprolactam (165,000 mt/y).

N-REN CORP.

Carlsbad, N.M. Feed: natural gas. Product: ammonia (70,000 mt/y).

East Dubuque, Ill. Feed: natural gas. Products: ammonia (250,000 mt/y).

Pine Bend, Minn. Feed: natural gas. Product: ammonia (27,000 mt/y).

Pryor, Okla. Feed: natural gas. Products: ammonia (75,000 mt/y).

NUODEX INC.

Chestertown, Md. Feed: alcohols, phthalic anhydride. Product: plasticizers (36,000 mt/y).

OCCIDENTAL CHEMICAL CO.

Addis, La. Feed: vinyl chloride. Product: polyvinyl chloride (133,000 mt/y).

Burlington, N.Y. Feed: vinyl chloride. Product: polyvinyl chloride (68,000 mt/y).

Pottstown, Pa. Feed: vinyl chloride. Product: polyvinyl chloride (94,000 mt/y).

OKLAHOMA NITROGEN CO.

(62.5% W.R. Grace, 37.5% Terra International)

Woodward, Okla. Feed: natural gas. Product: ammonia (408,200 mt/y).

OLIN CORP.

Brandenberg, Ky. Feed: mixed LPG stream. Products: ethylene (48,000 mt/y), ethylene glycol (27,000 mt/y), ethylene oxide (57,000 mt/y), propylene glycol (26,000 mt/y).

Lake Charles, La. Feed: natural gas. Products: ammonia (480,000 mt/y), urea (214,000 mt/y).

PHILLIPS CHEMICAL CO.

Orange, Tex. Feed: aromatic oil. Product: carbon black (61,000 mt/y).

Pasadena, Tex. Feed: butadiene, ethylene, propylene, styrene. Products: hd polyethylene (626,000 mt/y), polypropylene (109,000 mt/y), resins (68,000 mt/y).

Sweeny, Tex. Feed: benzene, crude oil, natural gas liquids. Products: aromatics mix (275,000 mt/y), cyclohexane (262,000 mt/y), ethylene (1,143,000 mt/y), propylene (255,000 mt/y).

POLYSAR INC.

Chattanooga, Tenn. Feed: butadiene, styrene. Product: SBR, latex (70,000 mt/y).

Copley, Ohio. Feed: styrene. Product: polystyrene (63,000 mt/y).

Leominster, Mass. Feed: styrene. Product: polystyrene (82,000 mt/y).

Monaca, Pa. Feed: butadiene, styrene. Product: SBR, latex (22,000 mt/y).

Orange, Tex. Feed: butadiene, ethylene, propylene. Product: butadiene rubber (88,000 mt/y).

PPG INDUSTRIES

Beaumont, Tex. Feed: ethylene. Products: ethylene glycol (269,000 mt/y), ethylene oxide (207,000 mt/y).

Lake Charles, La. Feed: ethylene. Products: ethylchloride (56,000 mt/y), ethylene dichloride (500,000 mt/y), vinyl chloride (230,000 mt/y).

REICHHOLD CHEMICAL INC.

Hampton, S.C. Feed: methanol. Product: formaldehyde.

Houston, Tex. Feed: methanol. Product: formaldehyde.

Kansas City, Kans. Product: formaldehyde.

Tacoma, Wash. Product: formaldehyde.

ROHM AND HAAS CO.

Bayport, Tex; Bristol and Croydon, Pa; Calumet City, Ill; Fayetteville, N.C.; Hayward, Calif; Louisville, Ky. Products: acrylics, acrylic esters, plasticizers, polyester, polyethylene, specialty acrylic monomers and polymers.

Deer Park, Texas. Feed: natural gas, propylene. Products: acrylic acid and esters (280,000 mt/y).

RUBICON INC.

Geismar, La. Feed: benzene. Product: aniline (136,000 mt/y).

SHELL CHEMICAL CO.

Deer Park, Tex. Feed: natural gas liquids, petroleum fractions. Products: benzene (501,000 mt/y), bisphenol A (158,000 mt/y), butadiene (226,000 mt/y), ethylene (812,000 mt/y), isoprene concentrate (49,000 mt/y), isopropanol (408,000 mt/y), normal paraffins (99,000 mt/y), orthoxylene (54,000 mt/y), phenol (247,000 mt/y), propylene (485,000 mt/y), resins (90,000 mt/y), toluene (167,000 mt/y), vinyl chloride (381,000 mt/y), xylene mix (181,000 mt/y).

Geismar, La. Feed: ethylene. Products: linear C_4 + olefins (340,000 mt/y), ethylene glycol (226,000 mt/y), ethylene oxide (362,000 mt/y), glycol ethers (29,000 mt/y).

Marietta, Ohio. Product: thermoplastic rubber (170,000 mt/y).

Norco, La. Feed: natural gas liquids, petroleum fractions. Products: butadiene (226,000 mt/y), ethylene (1,016,000 mt/y), polypropylene (136,000 mt/y), propylene (635,000 mt/y).

Odessa, Tex. Product: benzene (15,000 mt/y).

Seadrift, Tex. Product: polypropylene (79,000 mt/y).

Taft, La. Product: polybutylene (27,000 mt/y).

Woodbury, N.J. Product: polypropylene (147,000 mt/y).

Wood River, Ill. Products: benzene (149,000 mt/y), propylene (113,000 mt/y).

SHINTECH INC.

Freeport, Tex. Feed: vinyl chloride monomer. Product: polyvinyl chloride (400,000 mt/y).

SID RICHARDSON CARBON CO.

Addis, La. Feed: heavy oil and natural gas. Product: carbon black (55,792 mt/y).

Big Spring, Tex. Feed: heavy oil and natural gas. Product: carbon black (48,988 mt/y).

SIMPLOT & CO., J.R.

Pocatello, Idaho. Feed: natural gas. Product: ammonia (275 mt/d)

SOHIO CHEMICAL CO.

Green Lake, Tex. Feed: ammonia, propylene. Product: acrylonitrile (270,000 mt/y).

Lima, Ohio. Feed: ammonia, natural gas, propylene. Products: acrylonitrile (160,000 mt/y), ammonia (1,360 mt/d), urea (1,300 mt/d).

SOLTEX POLYMER CORP.

(subsidiary of Solvay & Cie.)

Deer Park, Tex. Feed: ethylene, propylene, Product: hd polyethylene, polypropylene.

STANDARD OIL COMPANY (OHIO)

Lima, Ohio. Feed: refinery gases. Product: propylene (430 mt/d).

STEPAN CHEMICAL CO.

Joliet, Ill. Feed: orthoxylene. Product: phthalic anhydride (77,000 mt/y).

SUN CI

Marcus Hook, Pa. Feed: crude, purchased gas oil and naphtha. Products: benzene (48,000 mt/y), propylene (184,000 mt/y), toluene (120,000 mt/y), xylene mix (82,000 mt/y).

Toledo, Ohio. Feed: crude. Products: benzene (83,500 mt/y), toluene (214,000 mt/y), xylene mix (147,600 mt/y).

Tulsa, Okla. Feed: crude. Products: benzene (5,000 mt/y), cyclohexane (81,000 mt/y), toluene (10,000 mt/y).

SUNOLIN CHEMICAL CO.

Claymont, Del. Feed: refinery dry gas, oxygen. Products: ethylene (108,863 mt/y), ethylene oxide (45,352 mt/y).

TENNECO OIL CO.

Chalmette, La. Feed: crude oil. Products: aromatics mix (50,000 mt/y), benzene (75,000 mt/y), orthoxylene (70,000 mt/y), paraxylene (70,000 mt/y), toluene (128,000 mt/y), xylene mix (50,000 mt/y).

TENNECO POLYMERS INC.

Burlington, N.J. Feed: vinyl chloride. Product: polyvinyl chloride (48,000 mt/y).

Pasadena, Tex. Feed: vinyl chloride. Products: polyvinyl chloride (325,000 mt/y).

TENNESSEE VALLEY AUTHORITY

Muscle Shoals, Ala. Feed: natural gas. Products: ammonia (200 mt/d), urea (300 mt/d).

TENN-USS CHEMICALS CO.

(100% USS Chemicals)

Pasadena, Tex. Product: phthalic anhydride (95,255 mt/y).

TERRA INTERNATIONAL INC.

Sioux City (Port Neal), Iowa. Feed: natural gas. Products: ammonia (650 mt/d), urea (635 mt/d).

TEXACO CHEMICAL CO.

Delaware City, Del. Feed: naphtha fractions. Products: benzene (73,000 mt/y), methanol (300,000 mt/y), naphthalene (45,000 mt/y), toluene (55,000 mt/y).

El Dorado, Kans. Feed: naptha fractions. Products: acetone (25,000 mt/y), phenol (43,000 mt/y).

Port Arthur, Tex. Feed: naphtha fractions, NGL. Products: benzene (165,000 mt/y), cyclohexane (200,000 mt/y), ethylene (450,000 mt/y), propylene (225,000 mt/y).

Port Neches, Tex. Feed: ethylene, NGL. Products: butadiene (225,000 mt/y), ethylene glycol (235,000 mt/y), ethylene oxide (300,000 mt/y), propylene glycol (25,000 mt/y).

TEXAS CITY REFINING INC.

Texas City, Tex. Feed: refinery streams. Products: propylene (73,000 mt/y).

TEXAS EASTMAN CO.

Harrison County, Tex. Feed: ethane, naphtha, propane. Products: acetaldehyde (215,000 mt/y), aromatics mix (100,680 mt/y), butanol (100,000 mt/y), butylenes-butadiene mix (50,000 mt/y), butyraldehyde (300,000 mt/y), ethanol (80,000 mt/y), ethylene (611,400 mt/y), ethylene glycol (85,000 mt/y), ethylene oxide (90,000 mt/y), oxoalcohols (223,000 mt/y), ld polyethylene (285,000 mt/y), polypropylene (70,000 mt/y), propylene (284,000 mt/y), solvents (200,000 mt/y).

TEXAS PETROCHEMICALS CORP.

(subsidiary of Texas Olefins Co.)

Houston, Tex. Feed: mixed C_4 olefins, diolefins, isobutane, methanol. Products: butadiene (350,000 mt/y), butene 1 (90,000 mt/y), diisobutylene (30,000 mt/y), isobutylene (25,000 mt/y), MTBE (470,000 mt/y).

TRIAD CHEMICAL CO.

(joint venture Mississippi Chemical and First Mississippi Corp.)

Donaldsonville, La. Feed: natural gas. Products: ammonia (1,000 mt/y), urea (1,200 mt/y).

UNION CARBIDE CORP.

Bound Brook, N.J. Feed: cumene, petroleum derived feedstocks, derivatives. Products: acetone (50,000 mt/y), formaldehyde (45,000 mt/y), phenol (80,000 mt/y), polystyrene.

Institute, W. Va. Feed: natural gas (LP-gas), naphthalene. Products: acetaldehyde, acetone, alkylbenzene, plasticizers.

Seadrift, Tex. Feed: ethane, propane. Products: acetylene (9,000 mt/y), butadiene, ethylbenzene (170,000 mt/y), ethylene (562,300 mt/y), ethylene glycol, ethylene oxide, oxoalcohols, ld polyethlene (362,874 mt/y), ld polyethylene (225,000 mt/y), lld polyethylene (308,000 mt/y), propylene, styrene (136,000 mt/y), solvents.

South Charleston, West Va. Feed: natural gas, refinery liquids, crude oil, petroleum fractions. Products: solvents, plasticizers.

Taft, La. Feed: ethane, propane, butane, paraffinate, naphtha. Products: acetic acid, acetylene (5,000 mt/y), acrylic acid and acrylic esters (90,000 mt/y), benzene (230 mt/y), butadiene, ethylene (498,900 mt/y), ethylene dichloride (70,000 mt/y), ethylene glycol, ethylene oxide, lidhdpolyethylene (327,273 mt/y), propylene.

Texas City, Tex. and Ponce, Puerto Rico. Feed: butadiene, ethylene, propylene. Products: acetylene (63,000 mt/y), butanol (168,000 mt/y), butyraldehyde (195,000 mt/y), ethanol (339,000 mt/y), ethylene—Ponce (412,700 mt/y), ethylene—Texas City (702,300 mt/y), isopropanol (349,000 mt/y).

UNOCAL CHEMICALS DIVISION

Beaumont, Tex. Feed: reformate. Products: benzene (92,500 mt/y), cyclohexane (89,000 mt/y), toluene (125,400 mt/y), xylene mix (135,900 mt/y).

Brea, Calif. Feed: natural gas. Products: ammonia (227,000 mt/y), urea (109,000 mt/y).

Bridgeview and Lemont, Ill. Product: polymers (62,900 mt/y).

Charlotte, N.C. Product: polymers (120,100 mt/y).

Kenai, Alaska. Feed: natural gas. Products: ammonia (1,034,000 mt/y), urea (907,000 mt/y).

La Mirada and Newark, Calif. Products: polymers (63,640 mt/y).

Lemont, Ill. Feed: reformate, primary light oil. Products: benzene (52,300 mt/y), toluene (51,500 mt/y), xylene mix (33,000 mt/y).

UNIROYAL CHEMICAL CO.

Geismar, La. Feed: ethylene, propylene. Product: ethylene-propylene rubber (44,000 mt/y).

U.S. INDUSTRIAL CHEMICALS CO.

Houston, Texas. Feed: ethylene. Products: acetic acid (272,156 mt/y), ld polyethylene (207,000 mt/y), hd polyethylene (250,000 mt/y), vinyl acetate (270,000 mt/y).

Port Arthur, Texas. Feed: ethylene. Products: ld polyethylene (86,000 mt/y), hd polyethylene (155,000 mt/y).

Tuscola, Illinois. Feed: ethylene. Products: ethanol (198,000 mt/y), ld polyethylene (77,000 mt/y).

USS AGRI-CHEMICALS

(Division of USX Corp.)

Cherokee, Alabama. Feed: natural gas. Products: ammonia (175,000 mt/y).

USS CHEMICALS

(Division of USX Corp.)

Bartow, Fla., Colton, Calif., Jacksonville, Ark., Linden, N.J., Neville Island, Pa. Feed: dibasic acids, alcohols, glycols, styrene. Product: polyester resins (109,346 mt/y).

Clairton, Pa. Products: benzene, toluene, xylene (163,078 mt/y).

Haverhill, Ohio. Feed: ammonia, cumene. Products: acetone (141,151 mt/y), benzene (141,320 mt/y), bisphenol A (54,432 mt/y), phenol (235,870 mt/y).

Houston, Texas. Feed: LPG, refinery offgas. Products: ethylene (226,860 mt/y), propylene (74,410 mt/y).

LaPorte, Tex., Neal, West Va. Feed: propylene. Product: polypropylene (217,785 mt/y).

VELSICOL CHEMICAL CORP.

Chattanooga, Tenn. Feed: benzoic acid, dipropylene glycol, diethylene glycol, propylene glycol. Product: plasticizers (12,700 mt/y).

VISTA CHEMICAL CO.

Baltimore, Md. Feed: benzene, n-paraffins. Products: alkylbenzene (102,000 mt/y).
y).

West Lake, La. Feed: benzene, ethane, kerosine. Products: alkylbenzene (68,000 mt/y), aromatics (7,600 mt/y), butadiene (14,500 mt/y), ethylene (295,000 mt/y), n-paraffins (150,000 mt/y), propylene (7,720 mt/y), vinyl chloride (317,000 mt/y).

VISTA POLYMERS INC.

(subsidiary of Vista Chemical Co.)

Aberdeen, Miss. and Oklahoma City, Okla. Feed: vinyl chloride monomer. Product: polyvinyl chloride (324,000 mt/y).

VULCAN MATERIALS CO.

Geismar, La. Feed: ethylene. Product: ethylene dichloride (100,000 mt/y).

URUGUAY

ITALCOLOR SA

San José. Feed: methanol. Products; formaldehyde (7,200 mt/y).

VENEZUELA

ESTIZULIA—Estireno del Zulia

(Pequiven, Grupo Zuliano, Dart Industries)

El Tablazo. Feed: styrene. Products: polystyrene (40,000 mt/y).

INTEQUIM—Quimica Integrada

Valencia. Products: acrylics (7,800 mt/y), alkyds (8,000 mt/y), formaldehyde (7,400 mt/y), polyester (5,600 mt/y).

NEGROVEN

Valencia. Feed: aromatic oil. Product: carbon black (40,000 mt/y).

NITROVEN—Venezolana del Nitrogeno

(Pequiven, Instituto Fomento Industrial)

El Tablazo. Feed: natural gas. Products: ammonia (594,000 mt/y-two units), urea (792,000 mt/y-two units).

OXIDOR—Oxidaciones Orgánicas

(Pequiven, Corimon, Invequímica)

Valencia, Edo. Carabobo. Feed: orthoxylene. Product: phthalic anhydride (18,000 mt/y).

PEQUIVEN—Petroquimica de Venezuela.

El Tablazo. Feed: ethane, natural gas, propane. Products: ethylene (150,000 mt/y), propylene (45,000 mt/y).

Morón, Edo Carabobo. Feed: natural gas. Products: ammonia (198,000 mt/y), urea (247,500 mt/d).

PETROPLAS—Plásticos Petroquímica

(100% Pequiven)

El Tablazo. Feed: chlorine, ethylene. Products: ethylene dichloride (79,000 mt/y), polyvinyl chloride (40,000 mt/y), vinyl chloride (48,000 mt/y).

PLASTILAGO—Plásticos del Lago

(Pequiven, Grupo Zuliano, CdF Chimie, Mitsui)

El Tablazo. Feed: ethylene. Product: hd polyethylene (60,000 mt/y).

POLILAGO—Polimeros del Lago.

(Pequiven, Grupo Zuliano, 30% Cdf Chimie)

El Tablazo. Feed: ethylene. Product: ld polyethylene (60,000 mt/y).

QUÍMICA VENOCO

(Industrias Venoco, Pequiven, Phillips Invest. Co., Shell Química de Venezuela)

El Tablazo and Valencia. Feed: benzene-propylene. Products: alkylbenzene (56,000 mt/y).

VIRGIN ISLANDS

ST CROIX PETROCHEMICAL CORP.

(joint venture Amerada Hess Corp. and Hercofina)

St. Croix. Feed: mixed xylenes. Product: paraxylene (275,000 mt/y).

YUGOSLAVIA

DOW CHEMICAL CO.

Zagreb. Product: polystyrene.

MIDYEAR FORECAST & REVIEW

First quarter worldwide production compared

Country	First quarter 1986	First quarter 1985 1,000 b/d	Change	Change, %
Non-OPEC				
United States	8,940	8,810	+130	+ 1
Canada	1,372	1,463	− 91	− 6
Brazil	579	517	+ 62	+12
Mexico	2,290	2,711	−421	−15
Other Non-OPEC	1,089	1,047	+ 42	+ 4
Western Hemisphere	14,270	14,548	−278	− 1
Norway	856	719	+137	+19
United Kingdom	2,711	2,660	+ 51	+ 1
Other	465	437	+ 28	+ 6
Western Europe	4,032	3,816	+216	+ 5
Egypt	814	877	− 63	− 7
Other Non-OPEC	713	592	+121	+20
Africa	1,527	1,469	+ 58	+ 3
Oman	507	447	+ 60	+13
Other Non-OPEC	226	217	+ 9	+ 4
Middle East	733	664	+ 69	+10
Australia	563	540	+ 23	+ 4
India	627	615	+ 12	+ 2
Malaysia	501	465	+ 36	+ 7
Other Non-OPEC	320	265	+ 55	+20
Asia-Pacific	2,011	1,885	+126	+ 6
Total Non-OPEC	22,573	22,382	+191	+ 0
OPEC	17,342	16,474	+868	+ 5
Total Non Communist	39,915	38,856	+1,059	+ 2
Communist				
China	2,496	2,390	+106	+ 4
USSR	12,086	11,923	+163	+ 1
Other	453	453	--	
Total Communist	15,035	14,766	+269	+ 1
Total World	**54,950**	**53,622**	**+1,328**	**+ 2**

First half crude and products stocks*

	†1986, 1,000 bbl	Change '86/'85, %	†1985, 1,000 bbl	Change '85/'84, %	†1984, 1,000 bbl
Motor gasoline	225,000	+ 3.0	218,344	+ 6.9	204,173
Naphtha jet fuel	5,700	− 8.5	6,227	− 9.8	6,906
Kerosine jet fuel	39,900	+ 9.2	36,537	+ 1.5	36,000
Distillate fuel oil	101,500	− 7.5	109,688	− 2.8	112,868
Residual fuel oil	37,500	− 5.4	39,622	−15.4	46,811
Unfinished oils	113,500	− 0.2	113,762	+ 2.7	110,781
Other§	161,900	− 2.6	166,241	−23.8	218,209
Total product stocks	**685,000**	**− 0.8**	**690,421**	**− 6.2**	**735,748**
Crude stocks	320,000	− 7.0	344,058	− 2.4	352,692
Total	**1,005,000**	**− 2.9**	**1,034,479**	**− 5.0**	**1,088,440**

*Excludes Strategic Petroleum Reserve. †At end of June. §Includes natural gas liquids and kerosine
Source: 1984-85, EIA; 1986, OGJ estimate

1986 U.S. demand up, crude supply down

	First half 1986		Third quarter 1986		Fourth quarter 1986		Year 1986	
	Volume, 1,000 b/d	Change from '85, %	Volume, 1,000 b/d	Change from '85, %	Volume, 1,000 b/d	Change from '85, %	Volume, 1,000 b/d	Change from '85, %
Demand								
Motor gasoline	6,850	+ 1.2	7,150	+ 2.7	7,110	+ 4.3	6,990	+ 2.3
Dist. 1-4	5,705	+ 1.2	5,965	+ 2.7	5,945	+ 4.3	5,830	+ 2.4
Dist. 5	1,145	+ 1.2	1,185	+ 2.8	1,165	+ 4.1	1,160	+ 2.2
Naphtha jet fuel	205	− 6.8	225	+ 7.9	225	+ 8.9	215	+ 0.5
Dist. 1-4	145	− 9.1	165	+11.5	165	+12.7	155	+ 0.6
Dist. 5	60	− 0.8	60	− 1.0	60	− 0.3	60	− 0.8
Kerosine jet fuel	1,060	+10.0	1,120	+11.7	1,140	+ 5.0	1,095	+ 9.0
Dist. 1-4	775	+10.0	820	+15.3	850	+ 5.1	805	+10.0
Dist. 5	285	+10.0	300	+ 2.9	290	+ 4.6	290	+ 6.2
Distillate fuel oil	3,040	+ 2.0	2,640	+ 3.6	3,100	+ 4.5	2,955	+ 3.0
Dist. 1-4	2,655	+ 2.0	2,240	+ 3.5	2,710	+ 4.5	2,565	+ 3.0
Dist. 5	385	+ 1.5	400	+ 3.9	390	+ 4.3	390	+ 3.2
Residual fuel oil	1,340	+ 9.2	1,100	+ 1.3	1,240	− 2.5	1,255	+ 4.4
Dist. 1-4	1,090	+11.0	855	+ 1.4	1,005	− 3.9	1,010	+ 4.9
Dist. 5	250	+ 2.0	245	+ 1.1	235	+ 4.0	245	+ 2.5
LPG and ethane	1,605	+ 0.9	1,510	+ 4.4	1,740	− 1.8	1,615	+ 1.0
Dist. 1-4	1,550	+ 0.6	1,460	+ 4.6	1,680	− 1.8	1,560	+ 0.9
Dist 5	55	+ 9.8	50	− 0.8	60	− 2.6	55	+ 3.8
Other products	1,910	− 0.8	2,400	+ 5.3	2,040	+ 7.6	2,005	+ 2.9
Dist. 1-4	1,605	− 1.2	2,010	+ 5.6	1,700	+ 8.0	1,730	+ 2.9
Dist. 5	305	+ 1.2	390	+ 4.0	340	+ 5.5	335	+ 2.8
TOTAL DOMESTIC DEMAND	**16,010**	**+ 2.1**	**16,145**	**+ 4.0**	**16,595**	**+ 3.6**	**16,190**	**+ 3.0**
Dist. 1-4	13,525	+ 2.1	13,515	+ 4.2	14,055	+ 3.5	13,655	+ 3.0
Dist. 5	2,485	+ 2.4	2,630	+ 2.8	2,540	+ 4.1	2,535	+ 2.9
EXPORTS	**795**	**+ 6.1**	**750**	**+ 1.0**	**780**	**−11.6**	**780**	**− 0.1**
Dist. 1-4	335	+ 8.2	335	+ 1.5	375	−13.9	345	− 0.3
Dist. 5	460	+ 4.6	415	+ 0.6	405	− 9.3	435	—
TOTAL DEMAND	**16,805**	**+ 2.3**	**16,895**	**+ 3.8**	**17,375**	**+ 2.8**	**16,970**	**+ 2.8**
Dist. 1-4	13,860	+ 2.2	13,850	+ 4.1	14,430	+ 3.0	14,000	+ 2.9
Dist. 5	2,945	+ 2.7	3,045	+ 2.5	2,945	+ 2.0	2,970	+ 2.4
Supply								
DOMESTIC PRODUCTION								
Crude & lease condensate	8,890	− 1.3	8,750	− 1.7	8,630	− 3.8	8,790	− 2.0
Dist. 1-4	5,860	− 2.8	5,730	− 3.1	5,610	− 5.6	5,765	− 3.5
Dist. 5	3,030	+ 1.6	3,020	+ 0.9	3,020	− 0.2	3,025	+ 1.0
NGL and other hydrocarbons	1,700	+ 3.0	1,650	+ 0.8	1,650	− 3.9	1,675	+ 0.7
Dist. 1-4	1,645	+ 3.0	1,595	+ 0.5	1,595	− 4.2	1,620	+ 0.6
Dist. 5	55	+ 1.1	55	+ 8.1	55	+ 5.6	55	+ 3.8
IMPORTS								
Crude	3,580	+25.4	3,950	+30.3	4,050	+11.4	3,790	+22.9
Dist. 1-4	3,390	+28.0	3,730	+29.7	3,830	+ 9.5	3,585	+23.3
Dist. 5	190	− 7.9	220	+39.8	220	+59.7	205	+16.5
Products & unfinished oils	1,800	− 2.7	2,000	+16.2	2,160	+ 5.6	1,940	+ 4.0
Dist. 1-4	1,695	− 1.4	1,875	+16.1	2,015	+ 3.6	1,820	+ 4.0
Dist. 5	105	−19.5	125	+18.5	145	+46.0	120	+ 3.4
Total imports	5,380	+14.4	5,950	+25.2	6,210	+ 9.3	5,730	+15.8
Dist. 1-4	5,085	+16.4	5,605	+24.8	5,845	+ 7.4	5,405	+16.1
Dist. 5	295	−12.4	345	+31.2	365	+53.9	325	+11.3
Processing gain, loss, etc.	720	+ 8.6	750	− 2.1	750	+ 5.0	735	+ 4.9
Dist. 1-4	610	+10.1	630	− 2.9	630	+ 6.2	620	+ 5.6
Dist. 5	110	+ 0.9	120	+ 2.6	120	− 0.8	115	+ 0.9
TOTAL NEW SUPPLY	**16,690**	**+ 4.1**	**17,100**	**+ 6.5**	**17,240**	**+ 0.9**	**16,930**	**+ 4.0**
Dist. 1-4	13,200	+ 5.2	13,560	+ 7.3	13,680	+ 0.3	13,410	+ 4.5
Dist. 5	3,490	+ 0.2	3,540	+ 3.4	3,560	+ 3.6	3,520	+ 1.9
STOCK CHANGE	**−115**	**—**	**+205**	**—**	**−135**	**—**	**−40**	**—**
Dist. 1-4	−660	—	−290	—	−750	—	−590	—
Dist. 5	+545	—	+495	—	+615	—	+550	—
CRUDE RUNS TO STILLS	**12,475**	**+ 6.4**	**12,780**	**+ 5.3**	**12,890**	**+ 4.0**	**12,655**	**+ 5.4**
TOTAL INPUT TO STILLS	**12,660**	**+ 6.7**	**12,970**	**+ 5.2**	**13,070**	**+ 3.9**	**12,840**	**+ 5.5**
TOTAL REFINERY CAPACITY	**15,525**	**− 0.7**	**15,515**	**− 1.2**	**15,515**	**− 1.3**	**15,520**	**− 1.0**
REFINERY UTILIZATION (%)	**81.5**	**+ 7.4**	**83.6**	**+ 6.5**	**84.2**	**+ 5.3**	**82.7**	**+ 6.6**
TOTAL INDUSTRY STOCKS*	**1,005**	**− 2.7**	**1,025**	**+ 1.2**	**1,010**	**− 1.5**	**1,010**	**− 1.5**
Refined products*	685	− 0.8	705	+ 1.3	690	− 2.0	690	− 2.0
Crude*	320	− 6.7	320	+ 1.1	320	− 0.3	320	− 0.3
Govt. SPR crude stocks*	502	+ 5.3	507	+ 3.6	513	+ 4.0	513	+ 4.0

* Million bbl at end of period.

First half crude, condensate output slips

	1,000 b/d		
	First half 1986*	First half 1985	Change, %
PAD District 1	59	59	—
Florida	32	32	—
Others	27	27	—
PAD District 2	1,034	1,050	– 1.5
Illinois	81	81	—
Kansas	204	206	– 0.8
Michigan	79	75	+ 5.3
North Dakota	138	141	– 2.1
Oklahoma	431	446	– 3.4
Others	101	101	—
PAD District 3	4,167	4,289	– 3.0
Alabama	59	59	—
Arkansas	50	51	– 2.0
Louisiana	1,364	1,429	+ 4.5
Mississippi	84	84	—
New Mexico	214	218	– 1.9
Texas	2,396	2,448	– 2.1
PAD District 4	599	630	– 4.9
Colorado	81	84	– 3.6
Montana	81	82	– 1.2
Utah	102	108	– 5.6
Wyoming	335	356	– 5.9
PAD District 5	3,031	2,982	+ 1.6
Alaska	1,872	1,822	+ 2.7
California	1,150	1,152	– 0.2
Others	9	8	+12.5
Total	**8,890**	**9,010**	**– 1.3**

*Estimated.

Energy consumption and efficiency

Year	GNP, Billion 1982 $	Energy consumption, Trillion BTU	Energy consumption per GNP $, 1,000 BTU	Oil consumption, Trillion BTU	Oil consumption per GNP $, 1,000 BTU
1929	711.8	23,756	33.4	5,521	7.8
1933	501.6	16,900	33.7	4,833	9.6
1940	775.0	23,589	30.4	7,407	9.6
1946	1,077.8	30,494	28.3	10,002	9.3
1950	1,206.6	33,992	28.2	13,489	11.2
1955	1,494.9	39,703	26.6	17,524	11.7
1960	1,665.3	44,569	26.8	20,067	12.1
1965	2,087.6	53,343	25.6	23,242	11.1
1970	2,416.2	67,143	27.8	29,537	12.2
1971	2,484.8	68,348	27.5	30,570	12.3
1972	2,608.5	71,643	27.5	32,966	12.6
1973	2,744.1	74,282	27.1	34,840	12.7
1974	2,729.3	72,543	26.6	33,455	12.3
1975	2,695.0	70,546	26.2	32,731	12.1
1976	2,826.7	74,362	26.3	35,175	12.4
1977	2,958.6	76,289	25.8	37,122	12.5
1978	3,115.2	78,088	25.1	37,965	12.2
1979	3,192.4	78,898	24.7	37,123	11.6
1980	3,187.1	75,952	23.8	34,202	10.7
1981	3,248.8	73,989	22.8	31,931	9.8
1982	3,166.0	70,840	22.4	30,232	9.5
1983	3,277.7	70,495	21.5	30,054	9.2
1984	3,492.0	74,108	21.2	31,051	8.9
1985	3,570.0	73,867	20.7	30,852	8.6
1986*	3,660.0	75,050	20.5	31,780	8.7
Rates of change, %					
1929-40	+ 8.9	– 0.7	– 9.0	+ 34.2	+23.1
1940-50	+ 55.7	+44.1	– 7.2	+ 82.1	+16.7
1950-70	+100.2	+97.5	– 1.4	+119.0	+ 8.9
1970-85	+ 47.8	+10.0	–25.5	+ 4.5	–29.5

* Estimate.

Product exports up

	1986		1985		1984
	3-month average (1,000 b/d)	Change from '85 (%)	3-month average (1,000 b/d)	Change from '84 (%)	3-month average (1,000 b/d)
Gasoline	0	—	2	− 60.0	5
Distillate	143	+320.6	34	− 27.7	47
Residual	168	− 38.5	273	+ 71.7	159
Lubricants	20	+ 33.3	15	− 11.8	17
Coke	195	+ 27.5	153	− 25.4	205
Petrochem feedstock	17	− 22.7	22	− 8.3	24
LPG	56	− 12.5	64	+ 36.2	47
Other refined products	31	—	31	+121.4	14
Total refined products	**630**	**+ 6.1**	**594**	**+ 14.9**	**517**
Crude	178	− 3.3	184	− 7.1	198
Total exports	**808**	**+ 3.9**	**778**	**+ 8.8**	**715**

Source: EIA

U.S. refinery utilization improves

	Crude runs	Input to distillation units	Operable capacity	Utilization rate %
	(1,000 b/d)			
1978	14,739	15,071	17,144	87.9
1979	14,646	14,950	17,660	84.7
1980	13,453	13,788	18,209	75.7
1981	12,471	12,751	18,603	68.5
1982	11,766	12,176	17,445	69.8
1983	11,345	11,645	16,831	69.2
1984	12,044	12,335	16,034	76.9
1985	12,002	12,165	15,671	77.6
1986*	12,655	12,840	15,520	82.7
1978-86 change				
(Volume)	−2,084	−2,231	−1,624	—
(Percent)	−14.1	−14.8	− 9.5	—
1985-86 change				
(Volume)	+653	+675	−151	—
(Percent)	+ 5.4	− 5.5	− 1.0	—

*OGJ estimate.

OPEC production climbs

Country	First quarter 1986	First quarter 1985	Change, 1,000 b/d	Change, %	OPEC quota Nov. 1984, 1,000 b/d
	1,000 b/d				
Algeria	584	660	− 76	−11.5	663
Ecuador	303	274	+ 29	+10.6	183
Gabon	160	150	+ 10	+ 6.7	137
Indonesia	1,300	1,302	− 2	− 0.2	1,189
Iran	1,959	2,156	−197	− 9.1	2,300
Iraq	1,746	1,255	+491	+39.1	1,200
Kuwait	1,169	914	+255	+27.9	900
Libya	1,007	1,051	− 44	− 4.2	990
Neutral Zone*	234	480	−246	−51.3	0
Nigeria	1,400	1,590	−190	−11.9	1,300
Qatar	334	292	+ 42	+14.4	280
Saudi Arabia	4,228	3,693	+535	+14.5	4,363
United Arab Emirates	1,366	1,100	+266	+24.2	950
Venezuela	1,152	1,557	− 5	− 0.3	1,555
Total OPEC	**17,342**	**16,474**	**+868**	**+ 5.3**	**16,000**

*Shared by Kuwait and Saudi Arabia.

U.S. natural gas supply and demand

	1986	1985	1984	1983	Change '86/85, %	Change '85/84, %
	Billion cu ft					
Production						
Texas	6,000	6,012	6,185	5,939	− 0.2	− 2.8
Louisiana	5,000	5,146	5,825	5,332	− 2.8	−11.7
Other states	5,910	6,060	6,220	5,551	− 2.5	− 2.6
Total production	**16,910**	**17,218**	**18,230**	**16,822**	**− 1.8**	**− 5.6**
Imports						
Canada	900	904	755	714	− 0.4	+19.7
Mexico	0	0	52	75	—	—
Algeria-LNG	0	23	36	131	—	−36.1
Total imports	**900**	**927**	**843**	**920**	**− 2.9**	**+10.0**
Supplemental gas	120	134	110	132	−10.0	+21.8
Losses, etc.*	−1,000	−1,185	−980	−1,432	−15.6	+20.9
Total supply	**16,930**	**17,094**	**18,203**	**16,442**	**− 1.0**	**− 6.1**
Exports	55	55	55	55	—	—
Stock change	—	−238	+197	−448	—	—
Total consumption	**16,875**	**17,277**	**17,951**	**16,835**	**− 2.3**	**− 3.8**

* Extraction losses, nonfuel gas and unaccounted for gas.
Source: 1983, 1984 and 1985, DOE; 1986 OGJ estimates

World crude prices drop by more than half

Country	Type of crude and API gravity	Current price,* $/bbl	Change 6-'86/ 1-'86, %	In effect Jan. 1, 1986, $/bbl	Change '86/'85, %	In effect Jan. 1, 1985, $/bbl	In effect Jan. 1, 1984, $/bbl	In effect Jan. 1, 1983, $/bbl	In effect Jan. 1, 1982, $/bbl
OPEC									
Saudi Arabia	Arabian Light 34°	12.74	−54.5	28.00	−3.4	29.00	29.00	34.00	34.00
Abu Dhabi	Murban 39°	12.35	−56.1	28.15	−4.0	29.31	29.56	34.56	35.50
Algeria	Saharan 44°	14.47	−51.0	29.50	−3.3	30.50	30.50	35.50	37.00
Nigeria	Bonny Light 37°	14.41	−49.8	28.65	+2.3	28.00	30.00	35.50	36.50
Libya	Es Sider 37°	10.30	−63.8	30.15	—	30.15	30.15	35.10	36.50
Indonesia	Minas 34°	11.80	−58.7	28.53	−3.4	29.53	29.53	34.53	35.00
Venezuela	Tia Juana 31°	13.66	−51.3	28.05	−6.0	29.84	29.84	35.00	35.00
Total OPEC		**11.94**	**−57.1**	**27.81**	**−2.2**	**28.43**	**28.50**	**33.54**	**34.13**
U.K.	Brent blend 38°	12.40	−52.3	26.00	−9.2	28.65	30.00	33.50	36.60
Norway	Ekofisk 42°	12.10	−54.5	26.61	−6.6	28.50	30.25	34.25	37.25
Mexico	Isthmus 33°	12.61	−51.9	26.21	−9.7	29.00	29.00	32.50	35.00
U.S.S.R.	Export blend 32°	12.40	−56.0	28.15	+0.5	28.00	28.60	31.20	35.49
Total world		**11.07**	[illegible]	**27.10**	**−4.3**	**28.33**	**28.61**	**33.00**	**34.18**
U.S.†		14.20	−40.7	23.96	−1.3	24.28	25.94	27.22	30.87

* Represents estimated contract prices based on government-stated prices, netback deals, and spot market quotations. Prices from 1982 to Jan. 1, 1986 were official prices. † U.S. average crude oil wellhead price.
Source: Energy Information Administration

rowth expected in U.S. energy demand

rgy source	1986	1985	1984	Change 986/1985 %	Change 985/1984, %	% of total market 1986	1985	1984
	Trillion BTU							
....	31,780	30,852	31,051	+3.0	− 0.6	42.4	41.8	41.9
s	17,410	17,813	18,507	−2.3	− 3.7	23.2	24.1	25.0
al	17,610	17,487	17,074	+0.7	+ 2.4	23.5	23.7	23.0
clear	4,480	4,144	3,538	+8.1	+17.1	5.9	5.6	4.8
dro. & geothermal	3,770	3,571	3,938	+5.6	− 9.3	5.0	4.8	5.3
al	**75,050**	**73,867**	**74,108**	**+1.6**	**− 0.3**	**100.0**	**100.0**	**100.0**

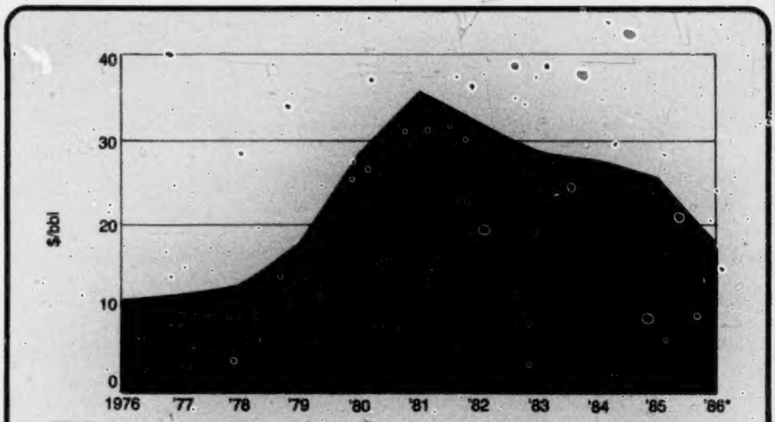
urce: 1984 & 1985, Energy Information Administration; 1986, OGJ estimates.

U.S. crude, product prices

Year	Average wellhead price crude, $/bbl	Refiner's acquisition cost of crude, $/bbl	Retail motor gasoline,* ¢/gal	Residential heating oil, ¢/gal	Average wellhead price natural gas $/Mcf
1976	8.19	10.89	59.5	40.6	0.58
1977	8.57	11.96	63.1	46.0	0.79
1978	9.00	12.46	75.2	49.0	0.91
1979	12.64	17.72	88.2	70.4	1.18
1980	21.59	28.07	122.1	97.4	1.59
1981	31.77	35.24	135.3	119.4	1.98
1982	28.52	31.87	128.1	116.0	2.46
1983	26.19	28.99	122.5	107.8	2.59
1984	25.88	28.63	119.8	109.1	2.66
1985	24.09	26.76	119.6	105.3	2.48
1986	14.50	16.10	93.4	82.3	1.95

* Average all types. Source: 1976-1985 DOE; 1986 OGJ estimate.

Refiner's crude costs continue to drop



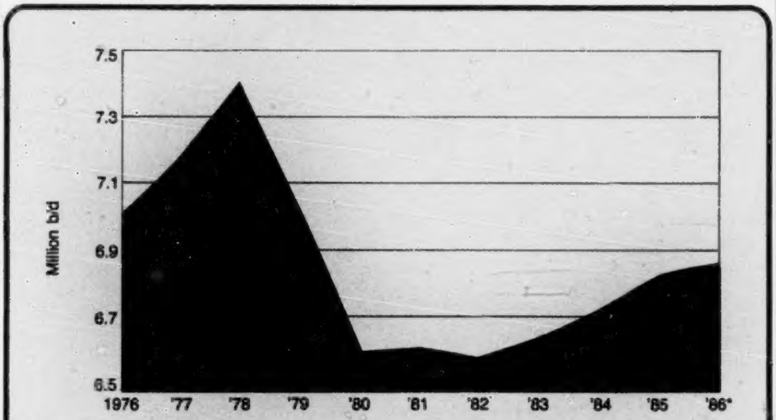
* Average for first six months.

Source: EIA for 1976-85; OGJ estimate for 1986.

OGJ

28-BE-4

Gasoline demand up again



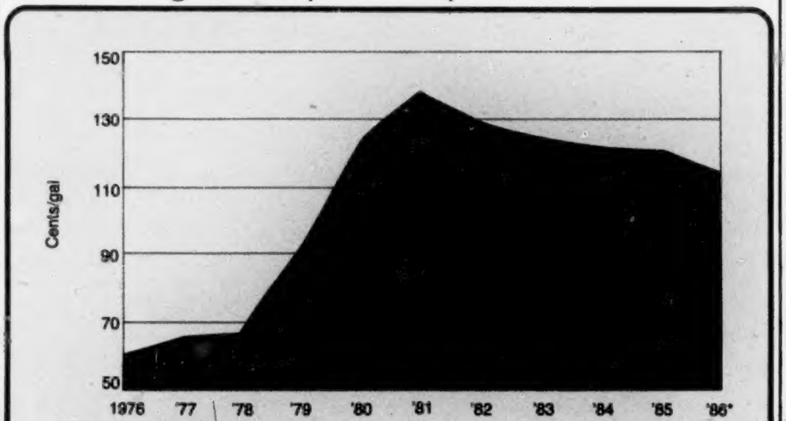
* Average for first 6 months.

Source: EIA for 1976-85; OGJ estimate for 1986.

OGJ

28-BE-5

Unleaded gasoline price drops



* Average for first 6 months.

Source: EIA for 1976-85; OGJ estimate for 1986.

OGJ

28-BE-6

Sources of U.S. imports

Average crude oil imports*

Country	Share of total 1986, %	First quarter average 1986, 1,000 b/d	Change 86/85, %	First quarter average 1985, 1,000 b/d	Change 85/84, %	First quarter average 1984, 1,000 b/d	Share of total 1984, %
Algeria	3.0	95	− 5.0	100	− 37.9	161	5.1
Angola	1.6	50	− 21.9	64	− 23.8	84	2.7
Australia	0.5	16	—	16	+118.6	7	0.2
Bahamas	—	0	—	0	—	0	—
Brazil	—	0	—	0	—	0	—
Canada	16.0	497	+ 12.4	442	+ 35.2	327	10.4
China	2.2	68	+871.4	7	− 5.6	7	0.2
Ecuador	1.3	39	− 4.9	41	− 37.2	65	2.1
Indonesia	7.1	222	− 9.1	244	+ 4.6	233	7.4
Mexico	17.3	538	− 18.5	660	+ 1.8	648	20.6
Netherlands Antilles	—	0	—	0	—	0	—
Nigeria	8.2	256	+ 42.2	180	− 25.4	241	7.7
Puerto Rico	—	0	—	0	—	0	—
Romania	—	0	—	0	—	0	—
Saudi Arabia	17.2	535	+664.3	70	− 80.1	351	11.2
Trinidad & Tobago	2.7	85	− 16.7	102	+ 56.4	65	2.1
United Arab Emirates	—	0	—	34	− 53.4	73	2.3
Venezuela	8.5	264	+ 15.8	228	+ 7.0	213	6.9
Virgin Islands	—	0	—	0	—	0	—
Western Europe	9.9	309	+ 38.6	223	− 48.7	435	13.8
Zaire	0.4	12	− 72.7	44	+ 52.1	29	0.9
Others	4.1	129	+ 24.0	104	− 50.0	208	6.6
Total	100.0	3,115	+ 21.7	2,559	− 18.7	3,149	100.0

Average refined product imports

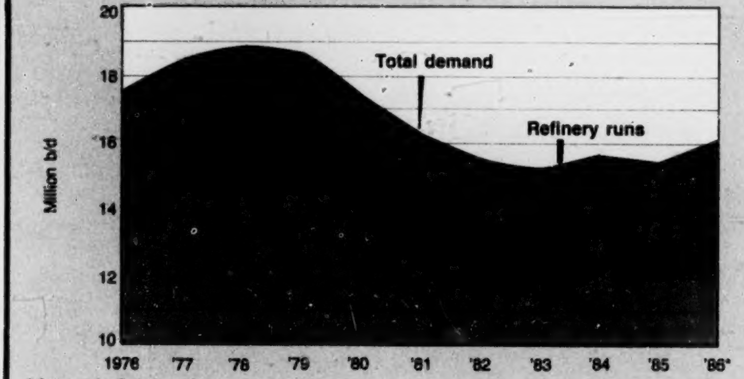
Algeria	6.0	107	+ 44.6	74	− 42.4	129	5.8
Angola	0.4	8	—	8	+ 28.2	6	0.3
Australia	0.9	16	− 20.0	20	+100.0	10	0.4
Bahamas	1.8	32	− 40.8	54	− 57.5	127	5.7
Brazil	2.0	36	− 35.7	56	+ 31.5	43	1.8
Canada	14.5	257	− 15.7	305	− 3.3	316	14.1
China	0.9	16	− 30.4	23	− 11.5	26	1.2
Ecuador	1.0	17	+ 41.7	12	+103.4	6	0.3
Indonesia	1.1	19	− 5.0	20	− 52.3	42	1.9
Mexico	4.8	86	− 30.1	123	+ 75.6	70	3.1
Netherlands Antilles	1.9	33	− 54.8	73	− 70.0	244	10.9
Nigeria	0.1	2	− 84.6	13	+ 69.7	8	0.4
Puerto Rico	1.2	22	− 38.9	36	− 25.4	48	2.1
Romania	1.6	29	− 53.2	62	+ 47.0	42	1.9
Saudi Arabia	2.6	47	+ 62.1	29	+107.6	14	0.6
Trinidad & Tobago	0.3	6	− 61.5	21	+125.1	9	0.4
United Arab Emirates	0.2	4	—	4	− 72.7	15	0.7
Venezuela	20.2	359	+ 20.5	298	+ 20.5	247	11.0
Virgin Islands	15.4	273	+ 19.7	228	− 34.9	350	15.6
Western Europe	5.5	97	—	97	− 42.2	168	7.5
Zaire	—	0	—	0	—	0	—
Others	17.6	310	+ 36.0	228	− 29.5	324	14.3
Total	100.0	1,776	− 0.4	1,784	− 20.4	2,242	100.0

Average total imports*

Algeria	4.1	202	+ 16.1	174	− 39.9	290	5.4
Angola	1.2	58	− 19.4	72	− 20.2	90	1.7
Australia	0.7	32	− 11.1	36	+107.9	17	0.3
Bahamas	0.7	32	− 40.7	54	− 57.5	127	2.4
Brazil	0.7	36	− 35.7	56	+ 31.5	43	0.8
Canada	15.4	754	+ 0.9	747	+ 16.3	643	11.9
China	1.7	84	+180.0	30	− 10.2	33	0.6
Ecuador	1.1	56	+ 5.7	53	− 25.6	71	1.3
Indonesia	4.9	241	− 8.7	264	− 4.1	275	5.1
Mexico	12.8	624	− 20.3	783	+ 9.0	718	13.3
Netherlands Antilles	0.7	33	− 54.8	73	− 70.0	244	4.5
Nigeria	5.3	258	+ 33.7	193	− 22.5	249	4.6
Puerto Rico	0.4	22	− 38.9	36	− 25.4	48	0.9
Romania	0.6	29	− 53.2	62	+ 47.0	42	0.8
Saudi Arabia	12.0	582	+487.9	99	− 72.9	365	6.8
Trinidad & Tobago	1.8	91	− 26.1	123	+ 65.0	75	1.4
United Arab Emirates	0.1	4	− 89.5	38	− 56.6	88	1.6
Venezuela	12.7	623	+ 18.4	526	+ 14.2	460	8.5
Virgin Islands	5.6	273	+ 19.7	228	− 34.9	350	6.5
Western Europe	8.3	406	+ 26.9	320	− 46.9	603	11.2
Zaire	0.2	12	− 72.7	44	+ 52.1	29	0.5
Others	9.0	439	+ 32.2	332	− 37.5	531	9.9
Total	100.0	4,891	+ 12.6	4,343	19.5	5,392	100.0

*Includes SPR imports.
Source: Energy Information Administration

Oil demand, refinery runs up



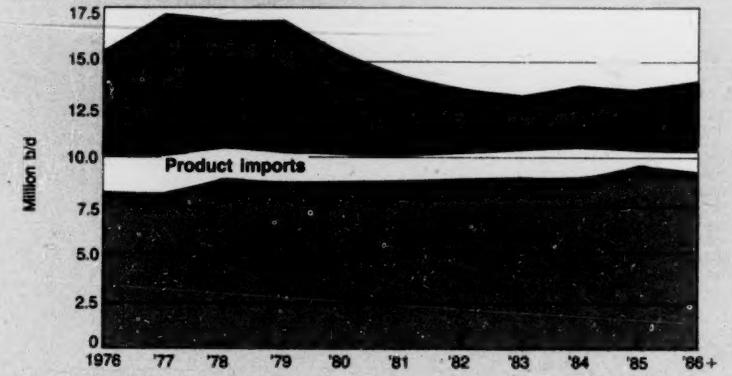
* Average for first 6 months.

Source: EIA for 1976-85; OGJ estimate for 1986.

OGJ

28-BE-1

Imports jump as production slides



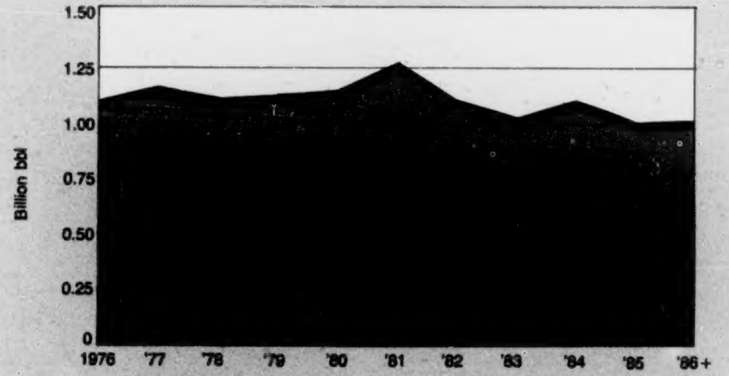
* Excludes SPR imports. + Average for first 6 months.

Source: EIA for 1976-85; OGJ estimate for 1986.

OGJ

28-BE-2

Stocks change slightly



* Excludes SPR imports. + End of June.

Source: EIA for 1976-85; OGJ estimate for 1986.

OGJ

28-BE-3

OGJ's revised drilling forecast for 1986—U.S. and Canada

State district, province	First half estimates Total comp.	Wildcats	Field wells	Total ft (1,000 ft)	1986 forecast Total comp.	Total wildcats	Field wells	Total ft (1,000)
Alabama	150	30	120	861	200	40	160	1,148
Alaska	135	15	120	1,102	270	25	245	2,204
Arizona	2	2	0	8	3	3	0	12
Arkansas	300	50	250	1,238	375	75	300	1,547
California	1,870	70	1,800	5,003	2,562	120	2,442	6,981
Onshore	1,800	60	1,740	4,462	2,442	100	2,342	6,053
Offshore	70	10	60	541	120	20	100	928
Colorado	605	140	465	3,737	850	190	660	5,250
Florida	20	9	11	274	32	12	20	438
Georgia	1	1	0	2	1	1	0	2
Idaho	1	1	0	6	3	3	0	18
Illinois	1,600	200	1,400	3,117	1,900	300	1,600	3,701
Indiana	200	65	135	339	300	100	200	508
Iowa	1	1	0	3	1	1	0	3
Kansas	2,500	900	1,600	8,987	3,600	1,400	2,200	12,942
Kentucky	800	100	700	1,149	1,365	165	1,200	1,960
Louisiana	2,140	321	1,819	14,416	3,380	480	2,900	21,683
North	1,100	50	1,050	3,435	1,880	80	1,800	5,871
South	740	156	584	7,848	900	200	700	9,545
Offshore	300	115	185	3,133	600	200	400	6,267
Michigan	300	110	190	1,303	450	150	300	1,954
Mississippi	151	50	101	1,392	250	70	180	2,304
Missouri	10	10	0	11	20	20	0	22
Montana	250	105	145	1,237	415	175	240	2,053
Nebraska	120	75	45	598	200	120	80	997
Nevada	21	15	6	116	24	18	6	132
New Mexico	650	115	535	3,921	1,070	170	900	6,451
East	350	40	310	2,186	570	70	500	3,560
West	300	75	225	1,735	500	100	400	2,891
New York	350	25	325	805	540	40	500	1,242
North Dakota	195	80	115	1,634	320	120	200	2,682
Ohio	1,600	25	1,575	6,037	2,700	40	2,660	10,187
Oklahoma	3,000	200	2,800	14,820	4,500	300	4,200	22,234
Oregon	3	1	2	7	12	10	2	30
Pennsylvania	1,500	40	1,460	5,700	2,100	50	2,050	7,986
South Dakota	20	12	8	135	22	14	8	149
Tennessee	230	100	130	327	325	125	200	462
Texas	9,908	1,549	8,359	49,437	15,540	2,290	13,250	76,963
District 1	1,500	130	1,370	3,933	2,600	200	2,400	6,817
District 2	300	120	180	2,065	460	180	280	3,167
District 3	700	125	575	5,116	1,100	200	900	8,039
District 4	750	129	621	5,647	1,200	200	1,000	9,036
District 5	220	40	180	1,150	360	60	300	1,880
District 6	400	90	310	2,444	620	120	500	3,789
District 7-B	1,850	210	1,640	5,522	3,000	350	2,650	8,955
District 7-C	700	140	560	4,000	1,100	180	920	6,273
District 8	1,250	120	1,130	7,536	1,800	180	1,620	10,852
District 8-A	750	180	570	5,038	1,200	280	920	8,060
District 9	1,100	185	915	3,996	1,500	220	1,280	5,450
District 10	328	40	288	2,371	500	60	440	3,614
Offshore	60	40	20	619	100	60	40	1,031
Utah	150	25	125	1,048	240	40	200	1,677
Virginia	17	1	16	95	30	5	25	168
West Virginia	950	10	940	3,958	1,500	15	1,485	6,250
Wyoming	550	195	355	3,723	900	300	600	6,093
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Alberta	3,600	1,500	2,100	15,012	4,900	1,900	3,000	20,433
Saskatchewan	900	265	635	2,980	1,225	325	900	4,056
British Columbia	180	75	105	954	210	85	125	1,113
Manitoba	125	35	90	355	170	40	130	483
Northwest-Arctic	46	21	25	250	60	25	35	326
Offshore eastern Canada	9	5	4	109	15	8	7	182

Drilling by the majors

	All wells				Wildcats	
	First half 1986	Planned last half	Total Drilled 1986	Total 1985	Planned 1986	Drilled 1985
Alabama	10	0	10	28	5	11
Alaska	116	94	210	285	9	40
Arkansas	7	8	15	31	4	10
California	855	849	1,704	2,024	32	61
Onshore	834	824	1,658	—	24	—
Offshore	21	25	46	—	8	—
Colorado	35	41	76	150	14	44
Florida	4	5	9	17	5	9
Georgia	0	0	0	1	0	1
Idaho	1	2	3	2	3	2
Illinois	66	10	76	252	0	8
Indiana	1	0	1	0	0	0
Kansas	75	61	136	158	24	35
Kentucky	0	0	0	10	0	4
Louisiana	345	338	683	1,023	135	214
North	30	25	55	77	4	11
South	102	123	225	376	31	61
Offshore	213	190	403	570	100	142
Michigan	64	73	137	203	28	38
Mississippi	22	13	35	69	8	33
Montana	10	27	37	101	19	27
Nebraska	6	6	12	14	3	8
Nevada	1	1	2	12	2	11
New Mexico	218	81	299	428	23	40
North Dakota	24	39	63	104	29	32
Ohio	0	0	0	47	0	4
Oklahoma	125	156	281	408	15	50
Oregon	2	6	8	2	8	2
Pennsylvania	11	80	91	117	0	3
South Dakota	0	0	0	2	0	2
Tennessee	0	0	0	0	0	0
Texas	1,151	1,103	2,254	5,238	177	381
South	300	183	483	556	43	140
East	68	54	122	228	6	22
West	697	773	1,470	4,139	84	128
North	44	65	109	195	9	25
Offshore	42	28	70	120	35	66
Utah	17	4	21	102	2	9
Virginia	0	0	0	2	0	2
Washington	0	0	0	2	0	2
West Virginia	6	13	19	32	1	2
Wyoming	87	52	139	408	35	59
[illegible]	[illegible]	[illegible]	6,321	[illegible]	581	[illegible]

U.S. well completions, footage*

Year	Total wells	Total footage, million ft	Wildcats
1960	44,018	190.7	11,704
1961	43,871	192.1	10,992
1962	43,779	198.6	10,797
1963	41,386	184.4	10,664
1964	42,963	189.9	10,747
1965	39,501	181.4	9,466
1966	36,384	162.4	10,313
1967	32,234	141.4	8,878
1968	30,559	145.0	8,879
1969	32,187	157.1	9,701
1970	28,173	138.6	7,436
1971	26,268	127.3	7,131
1972	27,934	138.8	7,551
1973	27,692	139.4	7,771
1974	33,037	153.8	8,969
1975	38,884	181.0	9,459
1976	40,940	187.3	9,317
1977	45,855	215.7	10,140
1978	50,061	238.4	11,030
1979	51,890	243.7	10,735
1980	69,486	311.4	12,870
1981	89,234	406.5	17,430
1982	83,889	375.4	15,882
1983	75,738	316.6	13,845
1984	85,359	368.3	15,128
1985	74,919	320.0	12,498

* Total wells not including service and stratigraphic wells. Total wildcats is total exploratory wells. Prior to 1970 data show wells reported to API. From 1970 on, data show wells in year actually completed regardless of when reported.

Rotary rig activity by states

	6-months average		% change	Week ending		% change
	1986	1985		6-30-86	7-1-85	
Alabama	14.5	20.0	– 27.5	9	24	– 62.5
Alaska	14.7	20.2	– 27.2	18	18	—
Arizona	0.0	0.0	—	0	0	—
Arkansas	12.0	26.8	– 55.2	6	28	– 78.6
California	54.5	80.5	– 32.3	39	66	– 40.9
Colorado	29.7	46.8	– 36.5	14	38	– 63.2
Florida	3.2	4.7	– 31.9	2	6	– 66.7
Georgia	0.0	0.0	—	1	0	—
Hawaii	0.2	0.3	– 33.3	0	0	—
Idaho	1.5	1.3	+ 15.4	1	0	—
Illinois	8.8	26.7	– 67.0	5	33	– 84.8
Indiana	1.2	4.2	– 71.4	1	3	– 66.7
Iowa	0.0	0.0	—	0	0	—
Kansas	52.0	91.3	– 43.0	40	93	– 57.0
Kentucky	2.8	5.3	– 47.2	3	8	– 62.5
Louisiana	170.5	300.5	– 43.3	98	272	– 64.0
North	11.7	28.5	– 58.9	6	23	– 73.9
Inland waters	23.7	45.8	– 48.3	14	50	– 72.0
South	51.8	91.0	– 43.1	37	76	– 51.3
Offshore	83.3	135.0	– 38.3	41	123	– 66.7
Maryland	0.2	0.0	—	0	0	—
Michigan	29.2	30.5	– 4.3	17	36	– 52.8
Minnesota	0.0	0.0	—	0	0	—
Mississippi	20.0	32.8	– 39.0	14	30	– 53.3
Missouri	0.0	0.0	—	0	0	—
Montana	13.0	23.0	– 43.5	4	30	– 86.7
Nebraska	4.2	6.5	– 35.4	3	7	– 57.1
Nevada	5.3	4.5	+ 17.8	2	3	– 33.3
New Mexico	36.3	69.0	– 47.4	16	72	– 77.8
New York	1.8	5.2	– 65.4	2	4	– 50.0
North Carolina	0.0	0.0	—	0	0	—
North Dakota	15.3	34.2	– 55.3	8	34	– 76.5
Ohio	16.3	29.8	– 45.3	11	28	– 60.7
Oklahoma	166.3	262.8	– 36.7	98	245	– 60.0
Oregon	0.0	0.7	– 100.0	0	0	—
Pennsylvania	15.7	29.7	– 47.1	15	26	– 42.3
Rhode Island	0.0	0.0	—	0	0	—
South Carolina	0.0	0.0	—	0	0	—
South Dakota	0.5	2.2	– 77.3	0	1	– 100.0
Tennessee	0.5	0.0	—	0	0	—
Texas	369.2	726.2	– 49.2	224	658	– 66.0
Offshore	24.2	56.2	– 56.9	16	52	– 69.2
Inland waters	3.2	3.7	– 13.5	2	4	– 50.0
Dist. 1 & 4	46.0	92.2	– 50.1	26	91	– 71.4
Dist. 2 & 3	54.8	110.0	– 50.2	33	87	– 62.1
Dist. 5 & 6	52.7	85.0	– 38.0	31	66	– 53.0
Dist. 7B & 9	42.0	95.8	– 56.2	30	90	– 66.7
Dist. 7C, 8 & 8A	129.7	244.8	– 47.0	75	226	– 66.8
Dist. 10	17.5	39.8	– 56.0	11	42	– 73.8
Utah	12.5	31.0	– 59.7	8	21	– 61.9
Virginia	5.0	2.5	+ 100.0	7	6	+ 16.7
Washington	0.0	0.0	—	0	0	—
West Virginia	12.0	25.2	– 52.4	13	27	– 51.9
Wyoming	41.3	89.8	– 54.0	18	87	– 79.3
Total U.S.						
Canada	228.7	279.7	– 18.2	68	316	– 78.5
Canada, Offshore	5.8	9.7	– 40.2	6	9	– 33.3
Grand Total						

Source: Hughes Tool Co. Note: Columns may not add to totals due to rounding.

WORLDWIDE GAS PROCESSING

Aileen Cantrell
Director of Editorial Surveys

Capacities as of January 1, 1986, and average production

		MMcfd		Production—1,000 gal/day (Average based on the past 12 months)								
Country	**No. plants**	**Gas capacity**	**Gas through-put**	**Ethane**	**Prop.**	**Isobut.**	**Process or unsplit butane**	**LP-gas mix**	**Raw NGL mix**	**Debut. nat. gaso.**	**Other**	**Total products**
United States												
Alabama	5	167.0	124.0	....	177.1	20.3	133.6	....	17.9	52.3	....	401.2
Alaska	2	82.0	44.4	....	2.9	....	....	....	36.1	....	....	39.0
Arkansas	6	962.5	870.4	....	20.8	5.5	14.4	....	12.8	44.9	6.2	104.6
California	36	1,066.0	731.8	16.8	467.8	9.7	263.7	82.7	407.8	79.2	12.6	1,340.3
Colorado	47	1,004.9	517.7	....	208.1	....	45.8	27.1	694.5	49.1	13.7	1,038.3
Florida	3	799.0	678.8	101.0	152.6	23.0	73.1	....	24.2	80.9	....	454.8
Kansas	28	5,646.0	3,418.0	56.5	698.3	66.6	216.4	2.6	1,063.5	176.9	800.4	2,280.8
Kentucky	3	916.0	651.3	....	....	....	....	....	275.0	...	206.0	481.0
Louisiana	94	20,366.4	10,758.5	887.0	946.1	307.6	308.3	31.1	6,204.0	722.5	678.6	10,085.2
Michigan	26	4,734.9	1,589.3	....	97.5	....	101.9	....	686.1	18.6	59.7	963.8
Mississippi	6	995.0	422.9	....	9.5	....	9.2	....	33.7	3.1	....	55.5
Montana	9	70.0	38.1	....	45.8	1.9	8.5	22.6	29.9	8.6	2.7	120.0
Nebraska	2	13.5	3.1	....	2.8	....	2.0	....	4.0	1.7	....	10.5
New Mexico	34	3,141.6	1,924.1	297.2	197.1	19.8	72.9	48.7	2,731.3	87.1	7.6	3,461.7
North Dakota	10	284.3	197.8	75.2	139.0	....	93.2	12.2	121.2	83.1	13.7	537.6
Oklahoma	108	4,989.8	2,898.2	414.7	763.8	131.2	267.7	274.8	3,272.1	291.4	276.5	5,692.2
Texas	384	19,630.8	12,116.4	3,084.7	3,281.1	469.7	1,460.7	818.7	13,358.0	2,075.2	2,000.5	26,548.6
Utah	11	531.5	259.5	....	111.1	....	28.5	....	157.0	44.3	....	340.9
West Virginia	7	430.0	320.6	233.1	136.1	23.8	44.8	73.0	281.6	2.0	....	794.4
Wyoming	41	1,897.9	1,188.9	1.1	351.9	3.7	210.7	160.9	424.1	277.2	198.1	1,627.7
Total U.S.	**862**	**67,729.1**	**38,753.8**	**5,167.3**	**7,809.4**	**1,082.8**	**3,355.4**	**1,554.4**	**29,834.8**	**4,098.1**	**3,475.9**	**56,378.1**
Abu Dhabi	5	2,498.0	1,551.8	....	357.2	288.8	20.2	....	....	203.9	309.2	1,179.3
Algeria	4	5,335.2	4,268.2	....	....	....	....	632.8	....	....	5,449.2	6,082.0
Argentina	11	1,715.9	1,428.8	545.0	500.9	....	349.1	....	....	306.7	....	1,701.7
Australia	5	2,070.0	1,180.0	414.0	974.0	....	487.0	....	941.0	2,236.0	1,232.0	6,284.0
Austria	2	5.7	3.9	....	....	....	....	....	....	....	....	....
Bahrain	1	143.0	110.0	....	108.4	....	91.5	....	....	135.5	....	335.4
Bangladesh	8	460.0	80.0	....	....	....	....	....	....	1.3	14.9	16.2
Bolivia	2	474.0	380.0	....	....	....	....	....	32.6	....	....	32.6
Brazil	6	369.4	309.2	....	....	....	....	399.7	222.4	89.6	....	711.7
Brunei	2	998.0	823.0	....	12.5	....	....	....	82.1	225.0	....	319.6
Canada												
Alberta	377	20,286.5	11,417.6	4,576.7	2,018.9	266.9	953.6	925.0	4,219.5	3,822.0	259.9	17,042.5
British Columbia	11	2,166.4	922.1	....	48.3	....	54.5	....	....	86.5	....	189.3
Northwest Territories	2	196.0	16.7	....	....	....	....	....	....	....	....	....
Saskatchewan	13	159.0	91.4	39.2	....	....	....	....	81.4	....	29.3	149.9
Chile	2	470.0	430.0	....	209.0	....	132.0	....	28.0	83.0	...	452.0
China, Taiwan	4	271.0	110.4	39.1	32.2	1.5	18.9	....	3.0	15.6	....	110.3
Colombia	2	125.0	121.5	82.0	45.3	....	11.7	....	....	18.9	....	157.9
Denmark	1	450.0	200.0	....	....	....	....	....	....	....	0.9	0.9
Dominican Republic	1	....	....	....	....	....	....	....	....	....	277.2	277.2
Dubai	1	330.0	312.0	....	....	....	....	....	....	....	1,016.4	1,016.4
Ecuador	2	....	....	....	....	....	....	2.4	9.1	....	....	11.5
Egypt	7	969.0	872.0	....	....	188.5	....	125.0	....	....	808.7	1,122.2
France	1	777.0	749.0	....	163.0	....	156.0	....	....	347.0	....	666.0
Germany	5	542.9	451.0	....	....	....	....	....	....	....	....	....
Greece	1	10.5	9.5	....	....	....	....	....	85.0	....	....	85.0
Hungary	12	855.9	462.8	....	97.0	13.5	84.0	91.0	216.2	108.0	458.7	1,068.4
Indonesia	10	884.3	620.4	....	526.7	....	....	51.6	465.2	175.1	227.9	1,446.5
Italy	16	7,101.0	4,909.0	....	....	....	....	29.6	175.0	15.4	....	220.0
Kuwait	1	1,680.0	360.0	....	834.0	....	548.0	....	....	305.0	85.0	1,772.0
Libya	7	1,851.0	1,227.0	....	....	....	....	37.8	5,577.0	....	551.0	6,165.8
Malaysia	2	282.0	72.0	....	130.0	....	112.0	....	....	164.0	....	406.0
Mexico	10	4,334.0	3,249.0	3,487.7	5,657.2	3.5	153.0	385.4	....	316.5	14.0	10,017.3
Netherlands	1	440.0	100.0	....	....	....	....	....	....	....	4.2	4.2
New Zealand	1	96.0	59.0	....	23.6	....	3.2	....	....	7.9	....	34.7
Norway	2	950.0	116.0	....	100.7	7.6	24.9	....	222.6	12.6	....	368.4
Pakistan	5	950.0	810.9	....	....	....	....	47.0	....	7.6	7.8	62.4
Peru	2	70.0	37.0	....	2.1	....	0.8	7.2	25.4	....	3.2	38.7
Qatar	2	580.0	313.9	....	504.1	....	334.4	....	....	257.5	....	1,096.0
Saudi Arabia	5	4,300.0	....	....	....	....	....	....	1,176.0	....	....	1,176.0
Sharjah	1	580.0	500.0	....	....	....	....	....	....	....	2,520.0	2,520.0
United Kingdom	7	2,648.2	1,508.0	....	332.0	....	291.0	....	180.6	1,748.5	75.4	2,627.5
Venezuela	17	4,251.0	3,348.0	....	394.5	137.2	132.7	440.8	1,222.4	239.2	....	2,566.8
Total, outside U.S.	**577**	**72,675.9**	**43,531.1**	**9,183.7**	**13,071.6**	**907.5**	**3,958.5**	**3,175.3**	**14,964.5**	**10,928.3**	**13,344.9**	**69,534.3**

Company, plant, location	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
	Gas capacity	Gas throughput	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
ALABAMA											
Exxon Co. USA—Big Escambia Creek, Escambia Co., 4-1n-7e	40.0	29.7	6-7	....	54.9	....	49.7	....	....	32.0	....
Petro-Lewis Corp.—Womack, Choctaw, Co., 9-10n-2w	4.0	2.5	3	....	6.1	....	6.0	....	....	3.5	....
Phillips Petroleum Co.—Chatom, Washington Co., ne4-29-6n-4w	31.0	NR	3	....	....	....	....	....	....	....	....
Texaco Inc.—*Hatter's Pond, Mobile Co., 10-2s-1w	35.0	32.9	3	....	48.1	20.3	23.0	....	....	16.8	....
Unocal—*Chunchula, Mobile Co., 22-1s-2w	57.0	34.1	3	....	68.0	....	54.9	....	17.9	....	....
Total	**167.0**	**124.0**		....	**177.1**	**20.3**	**133.6**	....	**17.9**	**52.3**	....
ALASKA											
Chevron USA Inc.—*Swanson River LTS, Kenai Borough, 4-7n-9w	30.0	30.4	3	....	2.9	....	....	....	12.1	....	....
Marathon Oil Co.—Trading Bay, Kenai Borough, 5-18n-15w-51n	52.0	14.0	7	....	....	....	....	....	24.0	....	....
Total	**82.0**	**44.4**		....	**2.9**	....	....	....	**36.1**	....	....
ARKANSAS											
Amoco Production Co.—*Chalybeat Springs, Columbia Co., 34-19s-19w	26.5	25.0	7	....	....	....	....	....	12.8	....	....
Arkla Energy Resources—Hamilton, Columbia Co., se9-18s-21w	20.0	10.1	2	....	8.3	2.7	4.0	....	....	4.0	^{11}3.2
Cal Gas Corp.—*Walker Creek, Columbia Co., 24-19s-23w	30.0	28.3	2	....	6.5	2.8	4.4	....	....	9.9	....
Cities Service Oil & Gas Corp.—*Walker Creek, Columbia Co., 23-19s-23w	25.0	23.0	2	....	6.0	....	6.0	....	....	8.0	^{11}3.0
Endevco Natural Gas Co.—Cummings, Miller Co.	11.0	4.0	1	....	....	....	....	....	....	....	....
Natural Gas Pipeline Co. of America—PP 370, White County, 29-7n-7w	850.0	780.0	3	....	....	....	....	....	....	23.0	....
Total	**962.5**	**870.4**		....	**20.8**	**5.5**	**14.4**	....	**12.8**	**44.9**	**6.2**
CALIFORNIA											
Arco Oil & Gas Co.—No. Coles Levee No. 8, Kern Co., 32-305-25e MDB&M	20.0	12.2	2	...	12.1	1.0	8.3	....	....	10.6	....
Ojai Timber No. 18, Ventura Co., Rancho Ojai 36	6.9	3.0	3	....	....	....	....	....	....	0.3	....
Chevron USA Inc.—Carpinteria, Santa Barbara Co., 33-4n-25w	23.0	11.5	3	....	0.9	....	4.0	....	....	1.8	....
Huntington Beach, Orange Co., 3-6s-11w	3.5	2.2	3	....	....	....	....	....	3.1	....	....
Inglewood LTS, Los Angeles Co., 8-25-14w	15.0	9.9	3	....	....	....	....	....	13.1	....	....
Kettleman 3-P, Kings Co., 3-22s-17e	10.0	7.0	3	....	....	....	....	....	10.0	....	....
McKittrick Seventeen-Z, Kern Co., 17-30s-22e	60.0	61.6	2	....	55.9	....	....	....	65.7	....	....
Murphy-Coyote, Orange Co., 18-3s-10w	5.0	1.6	3	....	....	....	....	....	3.3	....	....
Race Track 32-Z, Kern Co., 32-30s-29e	7.0	1.1	3	....	....	....	....	....	0.3	....	....
Taft 1-C LTS, Kern Co., 1-32s-23e	16.0	12.9	3	....	6.1	....	8.6	....	17.4	....	....
Torrance, Los Angeles Co., 24-4s-14w	3.0	1.4	3	....	....	....	....	....	1.4	....	....
Coastal Oil & Gas Corp.—Careaga Canyon, Santa Barbara Co., sw4 18-8n-33w	8.0	1.0	3	....	....	....	....	....	....	....	....
Department of Energy—35R, Kern Co., 30s-23e-35-R	94.0	71.9	1	....	38.6	....	49.7	....	40.7	....	....
LTS-1, Kern Co., 30s-23e-35R	100.0	112.5	3	....	87.5	....	73.6	....	66.5	....	....
LTS-2, Kern Co., 30s-23e-35R	100.0	111.3	3	....	96.5	....	73.7	....	64.7	....	....
Marathon Oil Co.,—*South Coles Levee, Kern Co., 3-31s-25e	80.0	50.0	2	....	17.0	2.7	5.7	....	....	12.5	^{11}12.6
Petrolane Lomita Gasoline Co.—Harbor, Los Angeles Co.	40.0	17.0	4	....	....	....	....	....	5.0	....	...
Signal Hill, Los Angeles Co.	14.0	6.5	3	....	2.8	....	....	....	20.0	....	....
Phillips Petroleum Co.—Huntington Beach, Orange Co., 3-6s-11w	15.0	NR	3	....	....	....	....	....	6.1	....	....
Santa Fe Energy Co.—Rincon, Ventura Co., 17-3n-24w SBB&M	15.0	5.3	1	....	8.7	....	3.1	....	....	....	....
Shell California Production Inc.—Clark Ave., Santa Barabara Co., 9-9n-33w	3.6	0.1	1	....	....	....	....	....	0.9	....	....
Kernridge, Kern Co., 32-28s-1e	50.0	34.0	2	16.8	12.9	....	....	31.4	....	....	....
Molino, Santa Barbara Co., 31-5n-31w	20.0	3.0	2	....	0.9	....	....	26.7	....	....	....
Sun Exploration & Production Co.—Newhall, Los Angeles Co. 27-4n-17w	70.0	20.6	2	....	5.1	....	....	....	7.6	....	....
Texaco Inc.—Buena Vista Hills, Kern Co., 8-32s-24e MDB&M	20.0	7.8	1	....	6.2	....	....	....	9.7	....	....

To arrive at more accurate totals, natural-gas throughput and liquids production are estimated at 80% capacity in those cases where only capacities are available. This explains apparent discrepancies in the addition of some columns. The letters NR mean no response. *Indicates cycling operations. The symbol < denotes less than 100 gal/day.

Products listed in the last column are identified by numbers: 1—isopentane, 2—upgraded motor fuel, 3—diesel, 4—kerosine, 5—ethane-propane mix, 6—solvent naphtha, 7—jet fuel, 8—normal pentane, 9—residuum, bottoms, 10—distillate, fuel oil, 11—condensate, 12—gas oil.

The process/conditioning methods in the third column are identified by the following numbers: 1—absorption, 2—refrigerated absorption, 3—refrigeration, 4—compression, 5—adsorption, 6—cryogenic—Joule-Thomson, 7—cryogenic-expander.

Figures in parenthesis do not represent primary production, and are not added in state totals.

Since this compilation includes cycling plants reprocessing pipeline gas, totals shown here for gas throughput do not relate directly to government data on total gas processed, or sold. Similarly, liquids production figures are based on yearly average and do not necessarily reconcile with government data.

Company, plant, location	MMcfd Gas capacity	Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Cymric, Kern Co., 26-29s-22e MDB&M	4.0	2.6	3	....	....	....	....	....	2.7	....	....
Honor Rancho, Los Angeles Co., 36-5n-17w-SBBM	18.0	0.4	3	....	....	....	....	....	....	0.3	....
Lost Hills, Kern Co., 9-27s-21e	60.0	30.1	3	....	18.9	....	....	....	26.1	....	....
Montebello, Los Angeles Co.	2.0	0.3	6	....	....	....	....	....	....	0.2	....
Shiells Canyon, Ventura Co., 4-4n-19w-SBBM	18.0	11.5	2	....	6.5	....	....	....	13.6	....	....
Ventura Co., 27-3n-23w SBB&M	20.0	16.1	2	....	28.0	6.0	13.7	....	....	16.5	....
Unocal—Battles, Santa Barbara Co., 24-10n-34w SBB&M	35.0	12.0	1	....	16.0	....	10.3	....	....	13.2	....
*Coalinga Nose, Fresno Co., 7-20s-16e	70.0	63.1	7	....	40.1	....	13.0	....	....	23.8	....
Dominguez, Los Angeles Co., 33-3s-9w	3.0	2.5	3	....	....	....	....	4.9	....	....	....
Santa Clara Valley, Ventura Co., 4n-18w	17.0	11.1	7	....	....	....	....	19.7	7.5	....	....
Stearns, Orange Co., 7-3s-9w SBB&M	20.0	4.7	1	....	7.1	....	....	....	22.4	....	....
Total	**1,066.0**	**731.8**		**16.8**	**467.8**	**9.7**	**263.7**	**82.7**	**407.8**	**79.2**	**12.6**

COLORADO

Amoco Production Co.—Peoria, Arapahoe Co., 33-4s-60w	12.0	4.6	7	....	12.6	....	....	....	12.0	....	[11]0.6
Spindle, Weld Co., 34-2n-67w	37.0	19.8	7	....	....	....	....	....	101.0	....	[11]12.8
Wattenberg, Adams Co., 31-3s-65w	250.0	85.2	7	....	....	....	....	....	165.2	....	....
Berthoud Gas Co.—Berthoud, Larimer Co., sw 16-4n-69w	2.5	0.7	3	....	....	....	....	....	1.5	....	....
Brighton Gas Process[illegible]—Brighton, Weld Co., se4 se4 28-1n-67w [illegible] PM	2.5	1.0	3	....	....	....	....	....	5.1	....	[11]0.3
Cabin Creek Gas—Cabin Creek, Adams Co., sw4 nw4 31-3s-59w 6th PM	1.5	0.2	3	....	....	....	....	....	1.8	....	[11]<0.1
Celsius Energy Co.—Dove Creek, Dolores Co., 5-40n-18w	10.0	3.8	3	....	....	....	....	....	8.0	....	....
Cerrito Land Co.—Piceance Creek, Rio Blanco Co., 15-25-96w (25 miles se of Rangely)	40.0	15.0	2	....	6.0	....	....	....	6.0	....	....
Champlin Petroleum Co.—Mt. Pearl, Cheyenne Co., 35-13s-48w	1.7	0.6	3	....	....	....	....	....	1.3	....	....
Chevron USA Inc.—Rangely Hagood, Rio Blanco Co., 23-2n-102w	10.0	6.0	3	....	....	....	....	....	21.0	....	....
Colorado Gathering & Processing Corp.—Pleasant Valley, Weld Co., nw¼ se½ 28-6n-65w	11.5	10.0	3&6	....	....	....	....	....	35.0	....	....
Coors Energy Co.—Wattenberg, Weld Co., 25-1n-68w	8.0	4.8	3	....	....	....	....	....	4.5	....	....
Damson Gas Processing Corp.—Roggen, Main, Weld Co., se¼ sw¼ 24-2n-63w	22.0	16.0	7	....	40.0	....	....	....	35.0	....	....
Roggen Tampa, Weld Co., se¼ sw¼ 24-2n-63w	9.0	9.0	7	....	15.0	....	....	....	10.0	....	....
Vallery, Morgan Co., 15-3n-59w	1.5	1.0	3	....	....	....	....	....	2.8	....	....
Ecological Engineering Systems Inc.—Holster, Adams Co., ne¼ sw¼ 21-25-66w	1.0	0.3	3	....	....	....	....	....	1.5	....	....
Lanson Farms, Weld Co., nw4-ne4 35-2n-68w	1.5	0.4	3	....	....	....	....	....	2.0	....	....
Greeley Gas Co.—Clyde, Prowers Co., 19-23s-45w	5.0	2.5	3	....	....	....	....	2.0	....	....	....
Gulf Energy Processing Corp.—Arroyo, Adams Co., 8-3s-58w	0.7	0.4	3	....	....	....	....	1.5	....	....	....
Chalice, Arapahoe Co., 10-4s-64w	3.0	1.6	3	....	....	....	....	4.8	....	....	....
Papoose Canyon, Dolores Co., 5-40n-18w	5.0	2.6	3	....	....	....	....	5.7	....	....	....
Running Creek, Elbert Co., 21-6s-64w	3.5	2.4	3	....	....	....	....	10.0	....	....	....
Koch Hydrocarbon Co.—Third Creek, Adams Co., 18-25-65w	25.0	14.6	2	....	13.7	....	....	....	69.1	....	....
Loveland Gas Processing CL—*Loveland, Larimer Co., se-se-se30-5n-68w	6.0	1.9	3	....	3.0	....	....	....	....	†4.4	....
McMoRan Oil & Gas Co.—Yenter, Logan Co., nw¼ 2-8n-54w	8.0	5.0	2	....	11.8	....	....	....	....	†10.5	....
Natural Gas Associates—Eaton, Weld Co., se 34-7n-66w	15.0	12.0	3	....	....	....	....	....	37.2	....	....
Greeley, Weld Co., sw25-5n-66w	4.5	4.5	6	....	....	....	....	....	14.5	....	....
Kersey, Weld Co., se 35-4n-66w	22.0	21.0	3	....	....	....	....	....	48.0	....	....
NGL Production Co.—Foundation Creek, Rio Blanco Co., 26-45n-102w	20.0	10.6	3	....	....	....	....	....	6.5	....	....
North Douglas Creek, Rio Blanco Co., 19-1s-101w	20.0	14.7	3	....	....	....	....	....	12.3	....	....
Northern Gas Products Co.—Greeley, Weld Co., sw 25-5n-6w	6.0	3.4	3	....	3.6	....	....	3.1	....	....	....
Northwest Pipeline Corp.—Ignacio, La Plata Co., sw¼ 36-34n-9w	300.0	186.0	7	....	78.0	....	45.0	....	23.0	32.0	....
Planet Engineers Inc.—McClave, Kiowa Co., sw½ 32-20s-48w	7.5	2.6	2	....	3.4	....	....	....	....	†2.2	....
Rocky Mountain Natural Gas Cl—Black Sulfur, Rio Blanco Co.	NR	1.2	3	....	....	....	....	....	0.3	....	....
Collbran, Mesa Co., 35-9s-95w	5.0	2.2	3	....	....	....	....	....	0.6	....	....
DeBeque, Garfield Co., 6-8s-97w	15.0	3.5	3	....	....	....	....	....	0.2	....	....
Piceance, Rio Blanco Co., 22-1n-97w	15.0	1.0	3	....	....	....	....	....	0.7	....	....
South Canyon, Garfield Co., 3-8s-104w	15.0	8.1	3	....	....	....	....	....	1.6	....	....
Sun Exploration & Production Co.—Denver Central, Arapahoe Co., 5-5s-62w	12.0	5.1	2	....	14.0	....	....	....	12.4	....	....
Dragon Trail, Rio Blanco Co., 35-2s-102w	18.0	8.6	2	....	7.0	....	....	....	7.1	....	....
Texaco Inc.—Wilson Creek, Rio Blanco Co., 27-3n-94w	4.5	0.4	3	....	....	....	....	....	3.9	....	....
Texas Oil & Gas Corp.—Baca County, 11-33s-42w Grid 9	5.0	1.9	3	....	....	....	....	....	1.3	....	....
Trend Exploration Ltd.—Buck Peak, Moffat Co., se4-sw4 9-6n-90w	3.0	0.5	3	....	<0.1	....	0.8	....	....	....	....
Unocal—Adena, Morgan Co., 12-1n-58w	4.0	1.4	3	....	....	....	....	....	6.1	....	....

Company, plant, location	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Vessels Gas Processing Co.—Irondale, Adams Co. se¼ 24-25-62w	8.0	2.6	3	....	....	....	....	....	12.8	....	....
Vessels Gas Processing Ltd.—Ft. Lupton, Weld Co., se¼ 26-1n-67w	26.0	17.0	3	....	....	....	....	....	23.2	....	....
Vessels Oil & Gas Co.—Oily Gas Fractionator, Weld Co., se¼ 26-1n-67w	...	...	§	(33.2)	(56.4)	....	(37.9)	....	....	(26.5)	....
Total	**1,004.9**	**517.7**		....	**208.1**	....	**45.8**	**27.1**	**694.5**	**49.1**	**13.7**

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†Butane-gasoline mix. §Fractionation. (Figures in parenthesis do not represent primary production, and are not added in state totals).

FLORIDA

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Exxon Co. USA—Blackjack Creek, Santa Rosa, 23-4n-29w	9.0	4.8	6	....	....	....	....	....	24.2	....	....
Jay, Santa Rosa Co., 9 n43-5n-29w	90.0	37.0	6-7	101.0	88.6	....	52.1	....	....	23.9	....
Northern Gas Products—Brooker, Bradford Co.	700.0	637.0	2	....	64.0	23.0	21.0	....	....	57.0	....
Total	**799.0**	**678.8**		**101.0**	**152.6**	**23.0**	**73.1**	....	**24.2**	**80.9**	....

KANSAS

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Amoco Production Co.—Ulysses, Grant Co., 5-29s-38w	400.0	209.2	2	....	62.9	....	....	....	142.8	....	....
Anadarko Production Co.—Cimarron, Seward Co., 23-33s-32w	20.0	7.8	2	....	3.4	....	....	....	4.3	....	....
Interstate, Morton Co., 29-34s-43w	16.0	4.0	2	....	2.1	....	....	....	2.9	....	....
Lone Star, Hugoton Co., se 18-33s-35w	4.0	1.2	3	....	....	....	....	....	0.9	....	....
Woods, Seward, 22-33s-34w	11.0	7.2	2	....	3.1	....	....	....	5.7	....	....
Cities Service Oil and Gas Corp.—Cheney, Kingman Co., nw4 22-28s-5w	100.0	37.0	7	....	....	....	....	....	72.0	....	....
Hutchinson, Reno Co., sw4 22-23s-6w	....	....	†	(99.0)	(270.0)	(42.0)	(106.0)	....	....	(107.0)	....
Jayhawk, Grant Co., 2-29s-35w	550.0	364.0	2&6	....	....	....	....	....	341.0	....	....
Midway, Kingman Co., 33-27s-5w	30.0	19.0	2	....	....	....	....	....	27.0	....	....
Spivey, Harper Co., 5-31s-8w	66.0	22.0	1	....	24.0	....	6.0	....	....	21.0	....
Sunflower, Scott Co., 17-18s-33w	168.0	98.0	3&6	....	....	....	....	....	130.0	....	....
Wichita, Sedgwick Co., 17-28s-1e	89.0	80.0	7	....	....	....	....	....	117.0	....	....
Wilburton, Morton Co., 33-34s-41w	5.0	3.0	3	....	....	....	....	....	9.0	....	....
Colorado Interstate Gas Co.—Lakin, Kearney Co., n2 of ne4 29-24s-36w	215.0	50.0	1	....	....	....	....	....	7.7	....	....
Gulf Energy Processing Corp.—Cedar Vale, Cowley Co., 32-33s-8e	1.5	0.3	3	....	....	....	....	0.4	....	....	....
Kansas Refined Helium Co.—*Otis, Rush Co., s½ 26-17s-16w 29.6 ac	24.0	17.0	6-7	....	0.2	0.4	0.9	....	....	1.8	‡800
KN Energy Inc.—Scott City Helium, Scott Co., 17-18s-33w	75.0	62.0	3	2.2	33.8	....	18.5	....	....	4.3	....
Scott City NGL, Scott Co., 17-18s-33w	150.0	99.8	1	....	....	....	2.0	....	....	12.8	....
Mesa Limited Partnership—*Ulysses, Grant Co., 10-30s-37w	242.0	53.5	2	....	....	....	....	....	64.6	....	....
Mobil Oil Corp.—Hickok, Grant Co., 31-28s-35w	210.0	93.8	1	....	8.7	....	....	....	14.1	12.8	....
National Helium Corp.—Seward Co., 23-33s-32w	1,000.0	559.0	3	....	0.8	....	34.4	....	81.3	....	....
Northern Gas Products—Bushton ethane, Ellsworth Co., 31-17s-9w	540.0	496.0	7	54.3	....	....	....	....	....	....	....
Bushton hydrocarbon, Ellsworth Co., 31-17s-9w	950.0	819.6	2	....	542.0	66.2	154.6	....	....	124.2	....
Northern Helex Co.—Northern Helex, Ellsworth Co., 31-17s-9w	520.0	124.0	6	....	....	....	....	....	....	....	‡0.4
Northern Natural Gas Co.—Holcomb, Finney Co., 3-24s-34w	200.0	172.7	3	....	....	....	....	....	26.3	....	....
Peoples Natural Gas Co.—Burrton, Harvey Co., 21-23s-3w	4.5	3.0	3	....	....	....	....	2.2	....	....	....
Texaco Inc.—Medicine Lodge, Barber Co. 13-32s-12w	30.0	6.4	1	....	6.4	....	....	....	6.4	....	....
Minneola, Ford Co., 13-29s-25w	25.0	8.5	2	....	10.9	....	....	....	10.5	....	....
Total	**5,648.0**	**3,418.0**		**56.5**	**698.3**	**66.6**	**216.4**	**2.6**	**1,063.5**	**176.9**	**800.4**

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†Fractionation. (Figures in parenthesis do not represent primary production, and are not added in state totals). ‡Helium—MMcfd.

KENTUCKY

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Kentucky Hydrocarbon—Dwale Cryogenic, Floyd Co.	20.0	10.2	3&7	....	....	....	....	....	....	....	†27.7
Maytown, Floyd Co.	51.0	41.1	3-6-7	....	....	....	....	....	....	....	†178.3
Olin Corp.—Gabe, Green Co.	845.0	600.0	3	....	....	....	....	....	275.0	....	....
Total	**916.0**	**651.3**		....	....	....	....	....	**275.0**	....	**206.0**

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†Ethane and heavier hydrocarbons in one stream.

LOUISIANA

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Amoco Production Co.—TSMA, Vermilion Par., 11-14s-1e	298.0	113.7	2	....	....	....	....	....	128.2	....	....
Anchor Gasoline Corp.—Krotz Springs, Pointe Coupee Par., 40&41 6s-7e	50.0	NR	1	....	....	....	....	8.8	....	2.4	....
ANR Production Co.—Pelican, St. Mary Par., 51&52 115s-11e	250.0	213.0	7	....	....	....	....	....	178.0	....	....
Arco Oil & Gas Co.—*Bayou Sale, St. Mary Par., 17-ILS-9e	97.0	36.3	2	....	7.1	....	5.1	....	....	6.2	....
Arkla Inc.—Bistineau, Webster Par., se-36-17n-10w se 31-17w-9w	60.0	17.3	1	....	....	....	....	3.5	....	4.0	††1.0
Gayles, Caddo Par., 30-16n-12w	20.0	2.5	5	....	....	....	....	....	....	0.5	....

Company, plant, location	MMcfd Gas capacity	MMcfd Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Cal Gas Corp.—Beacon, Webster Par., 26-21n-9w	50.0	33.8	2	....	11.8	7.4	6.9	....	....	11.2	[11]1.4
Beacon Fractionation, Webster Par., 26-21n-9w	....	....	†	....	(41.7)	(28.4)	(34.6)	....	....	(50.9)	([11]1.4)
Cities Service Oil and Gas Corp.—Crowley, Acadia Par., 41&44 9s-1w-1e	21.0	11.0	7	....	....	....	....	....	7.0	....	....
Lake Charles, Calcasieu Par., 19-10s-9w	....	....	†	(319.0)	(276.0)	(94.0)	(73.0)	....	....	(138.0)	....
*Panther Creek, Claiborne Par., 30-22n-4w	15.0	10.0	7	....	....	....	....	....	11.0	....	....
Claiborne Gasoline Co.—Claiborne Par., 20-21n-4w	NR	33.6	2	....	27.0	12.7	16.3	....	....	....	
Conoco Inc.—Acadia Par., 31-9s-1w	45.0	32.5	7	12.4	5.5	....	3.4	....	....	....	[2]88.4 [3]31.8 [4]0.8 [10]36.8 [5]0.6 [6]5.6 [9]0.1
Gillis, Calcasieu Par., se¼ sw¼ 14-9s-8w	180.0	169.4	7	148.2	73.0	23.7	18.1	....	....	33.1	[11]2.8
Grand Chenier, Cameron Par., 2-39-40 15s-6w	950.0	334.1	2&7	132.8	68.6	26.0	18.1	....	....	41.5	....
Damson Gas Processing Corp.—Kings Bayou, Cameron Par., ne¼ 34-14s-7w	80.0	14.5	2	....	....	....	....	....	12.0	....	....
*Neale, Beauregard Par.	2.0	0.5	3	....	....	....	....	....	1.5	....	....
Exxon Co.—Bluewater, Acadia Par., 34-10s-1w	950.0	763.0	6-7	....	....	....	....	....	758.6	....	....
Garden City, St. Mary's Par., 45-46-15s-10e	600.0	115.0	2	....	....	....	....	....	134.8	....	....
Grand Isle, Jefferson Par., 32-21s-25e	100.0	60.0	7	....	....	....	....	....	131.4	....	[11]0.9
Thibodaux, Lafourche Par., 35-36-15s-16e	45.0	5.5	2	....	3.9	....	....	....	4.7	....	....
Freeport-McMoran Co.—Chenier No. 1, Vermilion Par., 23-12s-1e	21.0	7.7	7	....	....	....	....	....	26.5	....	....
Gulf Energy Processing Corp.—Lake LaRose, St. Martin Par., 29-9s-8e	16.0	5.4	7	....	....	....	....	7.6	....	....	....
J-O'B Operating Co.—South Keatchie, DeSoto Par., 25-14n-16w	10.0	1.5	2	....	....	....	....	1.9	....	....	[11]4.5
Kerr-McGee Corp.—Bayou Crook Chene, St. Martinville Par., 34-10s-9e	12.5	NR	2	....	....	....	....	....	15.4	....	....
Louisiana Land & Exploration Co.—Pointe au Chien, Terrebonne Par., 18-19s-20e	125.0	80.0	7	....	....	....	....	....	55.0	....	....
Marathon Oil Co.—Burns Point, St. Mary Par., 10-17s-9e	200.0	62.0	7	....	....	....	....	....	52.0	....	....
Cotton Valley, Webster Par., 26-21n-10w	65.0	20.3	7	27.0	12.2	....	9.2	....	....	8.1	[11]11.2
Mitchell Energy & Development Corp.—Jackson Par.	5.0	2.1	3	....	....	....	....	....	2.5	....	....
Mobil Oil Exploration & Producing Southeast Inc.—Cameron Par., 23-15s-13w	310.0	196.0	7	....	....	....	....	....	41.7	....	[5]73.2
Cow Island, Vermilion Par., 29-13s-2e	950.0	321.0	2	....	....	....	....	....	245.0	....	....
Dulac, Terrebonne Par., 2&68 10s-17e	55.0	14.0	7	....	....	....	....	....	21.0	....	....
Grand Chenier, Cameron Par., 45&42-15s-6w	125.0	27.0	7	....	....	....	....	....	23.6	....	....
Iowa, Jefferson Davis Par., 18-9s-6w	500.0	354.0	7	....	....	....	....	....	176.2	....	....
Lowry, Cameron Par., 16-12s-4w	300.0	214.3	7	157.6	64.7	21.8	14.9	....	....	37.4	....
Riverside fractionation, Ascension Par., 8-10s-2e 46-9s-2e	....	....	†	....	(178.1)	(54.9)	(47.7)	....	....	(95.0)	([5]191.8)
Sea Robin 2, Vermilion Par., 21-13s-14e	150.0	99.0	7	....	....	....	....	....	113.6	....	....
South Timbalier, LaFourche Par., 28-20s-22e	125.0	104.0	7	....	....	....	....	....	70.1	....	....
Petro-Hunt Corp.—Kinder, Allen Par., 23-5s-5w	25.0	7.0	2	....	6.4	....	3.6	...	....	2.4	....
Phillips Petroleum Co.—No. Erath and Grosse Isle, Vermilion Par., sw4 se4 41-13s-4e	45.0	NR	2	....	....	....	....	....	....	....	....
Rollover, Jefferson Davis Par., nw4 22-11s-3w	190.0	NR	2	....	....	....	....	....	....	....	....
Valentine, LaFourche Par., 46-100-17-20e	15.0	NR	7	....	....	....	....	....	....	....	....
Placid Oil Co.—*Black Lake, Natchitoches Par., 14-11n-6w	217.5	217.1	2	....	....	....	....	....	205.3	....	[11]30.4
Patterson II, St. Mary Par., 48-15s-11e	600.0	50.1	7	....	....	....	....	....	81.1	....	....
Resources Extraction & Processing Co.,—Bayou Vista 1, St. Mary Par., 11-155-11e	200.0	200.0	7	64.2	24.3	7.6	7.3	....	....	16.0	....
Shell Western E&P Inc.—Barracuda, Cameron Par., 15s-13w	195.0	112.0	7	....	....	....	....	....	135.4	....	....
Black Bayou, Cameron Par., 17-12s-12w	18.0	11.0	2	....	....	....	....	....	3.8	....	....
Calumet, St. Mary Par., 11, 12, 51, 52,-15s-11-3	1,200.0	515.0	2	....	....	....	....	....	319.5	....	....
Crawfish, St. Charles Par., 36-13s-8e	120.0	48.0	7	....	....	....	....	....	45.8	....	....
Norco fractionator, St. Charles Par., 6-12s-8e	....	....	†	(403.3)	(320.7)	(107.9)	(128.0)	....	....	(167.3)	....
North Terrebonne, Terrebonne Par., 19,20, 29,33-17s-15e	1,250.0	587.0	2	....	....	....	....	....	607.6	....	....
Stingray, Cameron Par., 33&34-15s-13w	295.0	207.0	2	....	....	....	....	....	112.7	....	....
Tebone fractionator, Ascension Par., 45&46-9s-2e	....	....	†	(192.5)	(179.1)	(57.1)	(56.5)	....	....	(122.4)	....
Timbalier Bay, Terrebonne Par., nw4 of 32-16 sw 4 of 33-19s-19e	100.0	33.0	7	....	....	....	....	....	46.4	....	....
Toca, St. Bernard Par., 54-14s-14e	830.0	447.0	2&7	....	....	....	....	....	584.9	....	....
*Weeks Island, Iberia Par., 37-14s-6e	130.0	31.0	2	....	2.8	....	....	9.3	....	....	....
Yscloskey, St. Bernard Par., 39-13s-15e	1,850.0	847.0	2	....	....	....	....	....	567.7	....	....
Sid Richardson Carbon & Gasoline Co.—Hico-Knowles, Lincoln Par., 9 acres sw¼ of se¼ 10 & nw¼ of ne¼ 15-20n-3w	15.0	3.5	7	....	....	....	....	....	5.6	....	[11]130.0
Sun Exploration & Production Co.—Delhi, Richland Par., 15-17n-9e	22.0	21.3	6	4.3	7.9	2.2	3.1	....	....	18.6	....
*Fordoche, Pointe Coupee Par., 41-6s-8e	50.0	36.7	2	....	....	....	....	....	36.1	....	....
*Gillis-English Bayou, Calcasieu Par., 26-8s-5w	20.0	13.1	2	....	....	....	....	....	22.2	....	....
*Maurice, Lafayette Par., 31-10s-4e	32.0	11.6	2	....	....	....	....	....	17.2	....	....

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas throughput	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
South Sarepta, Bossier Par., 21-22n-11w	25.0	5.5	2	....	....	....	....	....	7.3	....	....
Taylor Energy Co.—*Chalkley, Cameron Par., 27-12s-12w	25.0	2.5	1	....	....	....	....	....	1.7	....	....
Tenneco Oil Processing & Marketing—											
Aymond, St. Mary Par., 13-14s-9e	50.0	26.9	7	....	....	....	....	....	41.6	....	....
Gibson, Terrebonne Par., 77-16s-15e	100.0	84.7	7	....	....	....	....	....	....	97.7	....
Plaquemine, Iberville Par., 46-10s-12e	225.0	136.0	7	....	40.8	19.0	17.7	....	....	41.0	[5]140.0
Sabine Pass, Cameron Par.	200.0	73.2	7	....	....	....	....	....	82.2	....	....
Plaquemine, Iberville Par.	225.0	116.2	7	....	39.4	17.3	16.3	....	....	32.5	[5]119.1
Stephen, Claiborne Par., 6&7-13s-12e	35.0	4.3	2	....	3.5	....	3.4	....	....	2.5	....
St. Landry, Evangeline Par., 35-2s-2e	70.0	62.4	2	....	29.4	....	20.1	....	....	13.2	....
Texaco Inc.—Alligator Bayou, St. Martin Par. sw14 34-10s-9e	30.0	9.6	7	....	....	....	....	....	15.8	....	....
Floodway, St. Mary Par., 16-16s-12e	600.0	279.0	7	....	....	....	....	....	268.1	....	....
Fordoche, Pointe Coupee Par., 28-6s-8e	45.0	3.6	2	....	2.2	....	1.5	....	....	1.3	....
Henry, Vermilion Par., 21-13s-4e	412.5	260.0	2	72.2	51.8	15.6	....	....	....	52.4	....
Hollywood, Terrebonne Par., 10-17s-17e	160.0	20.4	2	....	....	....	....	....	32.4	....	....
Paradis, St. Charles Par., 39-14s-20e	660.0	314.0	2&7	47.8	96.9	32.0	34.9	....	....	66.4	....
Sea Robin, Vermilion Par., 21-13s-4e	900.0	501.0	7	....	....	....	....	....	499.5	....	....
Venice, Plaquemines Par., 25&26 21s-30e	65.0	26.3	2	....	....	....	....	....	18.9	....	....
Texas Gas Exploration Corp.—Eunice, Acadia Par., sw¼ of nw¼-12-7s-2w	1,350.0	1,100.0	2&7	212.0	262.0	90.0	71.0	....	....	167.0	....
Lake Enfermer, 9-20s-23e	40.0	26.0	7	8.5	7.1	2.4	4.0	....	....	10.3	....
Texas Oil & Gas Corp.—Ruston, Lincoln Par., ne4 of nw4 12-19n-4w	30.0	16.4	3	....	....	....	....	....	11.3	....	....
Tipperary Corp.—Perry Point, Vermilion Par., 41-10-2e	15.0	8.0	7	....	....	....	....	....	10.0	....	....
White Castle, Iberville Par., 15-10s-13e	7.5	2.0	7	....	....	....	....	....	7.5	....	....
Union Texas Petroleum—Cox Bay, Plaquemine Par., 5-18s-16e	10.0	9.2	2	....	2.2	0.8	0.9	....	....	1.6	....
Pointe-a-la-Hache, Plaquemine Par., 78-13s-14e	20.0	8.6	2	....	1.3	0.5	†0.5	....	....	1.1	....
Sligo, Bossier Par., 29-18n-11w	70.0	20.9	2	....	7.3	1.8	2.8	....	....	6.6	....
Toca, St. Bernard Par., 56-14s-14e	160.0	15.3	2	....	39.6	12.6	14.9	....	....	26.5	....
Warren Petroleum Co.—Johnsons Bayou, Cameron Par., 32&33-15s-12w	NR	5.6	7	....	....	....	....	....	4.9	....	....
Krotz Springs, St. Landry Par., 22-6s-7e	NR	11.1	2	....	....	....	....	....	82.0	....	....
Mermentau, Acadia Par., n½-n½ 70-10s-2w	NR	14.9	1	....	....	....	....	....	22.1	....	....
Sabine Pass, Cameron Par., 7-15s-15w	195.0	30.0	2	....	....	....	....	....	21.0	....	....
Vermilion Par., s2 sw4 nw4 28-13s-2e	NR	62.3	7	....	....	....	....	....	76.6	....	....
Venice, Plaquemines Par., 25-21s-30e	NR	380.2	2	....	47.4	14.2	14.3	....	....	21.0	....
Total	**20,366.4**	**10,758.5**		**887.0**	**946.1**	**307.6**	**308.3**	**31.1**	**6,204.0**	**722.5**	**678.6**

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†Fractionation. (Figures in parenthesis do not represent primary production, and are not added in state totals).

MICHIGAN

Company, plant, location	Gas capacity	Gas throughput	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Amoco Production Co.—Kalkaska Co., 31-27n-7w	180.0	124.3	7	....	64.6	....	101.9	....	....	....	[11]30.1
ANR Pipeline Co.—*Austin dehydration, Mecosta Co., 4-14n-9w	500.0	120.0	5	....	....	....	....	....	....	....	[11]1.3
*Capac dehyd., St. Clair, 16-7n-13e	300.0	87.0	1	....	....	....	....	....	....	....	....
*C. Charlton-1 sep., Otsego Co., 1-30n-1w	220.0	134.0	3	....	....	....	....	....	....	....	[11]14.3
*Coldwater dehyd., Isabella Co., 29-16n-6w	40.0	9.0	1	....	....	....	....	....	....	....	....
*Croton dehyd., Newaygo Co., 29-12n-11w	50.0	14.0	1	....	....	....	....	....	....	....	....
*Goodwell dehyd., Newaygo Co., 4-14n-11w	385.0	157.0	5	....	....	....	....	....	....	....	[11]0.9
*Lincoln dehyd., St. Clair Co., 16-7n-13e	300.0	131.0	5	....	....	....	....	....	....	....	[11]0.9
*Loreed, Osceola Co., 30-18n-10w	32.0	30.3	3	....	....	....	....	....	1.3	....	....
*Loreed dehyd., Osceola Co., 30-18n-10w	1,000.0	178.0	1	....	....	....	....	....	....	....	....
*Muttonville dehyd., Macomb Co., 13-4n-14e	450.0	95.0	1	....	....	....	....	....	....	....	....
*North Hamilton dehyd., Clare Co., 6-19n-3w	40.0	7.0	1	....	....	....	....	....	....	....	....
*Norwich dehyd., Newaygo Co., 4-14n-11w	50.0	7.0	1	....	....	....	....	....	....	....	....
*Orient dehyd., Osceola Co., 13-17n-7w	50.0	7.0	1	....	....	....	....	....	....	....	....
*Reed City dehyd., Osceola Co., 30-18n-10w	300.0	91.0	1	....	....	....	....	....	....	....	....
*South Chester-15 sep., Otsego Co., 15-29n-2w	270.0	115.0	3	....	....	....	....	....	....	....	[11]10.9
*Winfield dehyd., Montcalm Co., 7-12n-9w	100.0	30.0	1	....	....	....	....	....	....	....	....
Lakeville Gas Associates.—Leonard, Oakland Co., Addison e¼-15-5n-11e	20.0	3.5	1&3	....	....	....	....	....	5.0	....	....
Marathon Oil Co.—Scipio, Hillside Co., 10-5s-3w	38.0	8.4	2	....	22.9	....	....	....	....	18.6	....
Michigan Consolidated Gas Co.—Romeo, Macomb Co., 14-4n-12e	15.0	13.5	3	....	....	....	....	....	9.7	....	....
Mobil Oil Corp.—Aurelius, Ingham Co., 36-2n-2w	23.0	7.3	2	....	10.0	....	....	....	10.4	....	[9]1.3
Shell Western E&P Inc.—Kalkaska Co., 32-27n-7w	350.0	207.0	2&7	....	....	....	....	....	627.7	....	....
Sun Exploration & Production Co.—											
*Columbus III, Saint Clair Co., 3-5n-15e	7.4	7.4	3	....	....	....	....	....	6.9	....	....
Mt. Pleasant, Isabella Co., 2-14n-3w	3.0	0.5	3	....	....	....	....	....	0.3	....	
Norwich, Missaukee Co., 12-24n-5w	10.0	4.3	6	....	....	....	....	....	23.4	....	....
Williams, Midland Co., 35-15n-2e	1.5	0.8	3	....	....	....	....	....	1.4	....	....
Total	**4,734.9**	**1,589.3**		....	**97.5**	....	**101.9**	....	**686.1**	**18.6**	**59.7**

MISSISSIPPI

Company, plant, location	Gas capacity	Gas throughput	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Koch Hydrocarbon Co.—Harmony, Clarke Co., 26-2n-14e	30.0	5.6	3	....	6.2	....	5.1	....	5.5	....	....
Shell Western E&P Inc.—Goodwater, Clarke Co., 5-10n-8w	15.0	6.0	3	....	3.3	....	4.1	....	....	3.1	....
Tallahala Creek, Smith Co., 5-1n-9e	4.0	4.0	3	....	....	....	....	....	4.9	....	....
Thomasville, Rankin Co., 27-4n-3e	100.0	58.0	....	....	....	....	....	....	....	....	....

Company, plant, location	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Southern Natural Gas Co.—*Muldon, Monroe Co., 27-15s-6e	750.0	324.0	5	....	....	....	....	....	11.3	....	....
Valero Hydrocarbon—Waveland, Hancock Co., 10-8s-51w	96.0	25.3	7	....	....	....	....	....	12.0	....	....
Total	**995.0**	**422.9**		....	**9.5**	....	**9.2**	....	**33.7**	**3.1**	....

MONTANA

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
ANR Production Co.—Stateline, Richland Co. 7 22n-59e	12.0	3.0	3	....	6.9	....	....	6.9	....	....	[11]1.2
Flying J Inc.—Glacier Co., 22-33n-5w	30.0	23.0	1-2	....	10.4	....	8.5	....	8.1	....	....
MGPC—Fairview, Richland Co., 24-25n-58e	6.0	3.9	3	....	8.4	....	....	7.9	....	....	....
Shell Western E&P Inc.—Cabin Creek, Fallon Co., 18-10n-58e	1.9	1.0	3	....	....	....	....	....	....	7.2	....
Little Beaver, Fallon Co., 8-4n-62e	0.4	0.3	3	....	1.2	....	....	1.4	....	....	....
South Pine, Wibaux Co., 10-11n-57e	1.2	1.0	4	....	....	....	....	....	5.5	....	....
True Oil Co.—Bob Rhodes, Richland Co., ne 4-25n-58e	4.0	0.9	3	....	....	....	....	....	5.8	....	....
Utex Oil Co.—Stateline, Richland Co., nw¼ sw¼ 8-23n-59e	12.0	3.0	3	....	8.9	....	....	....	8.0	....	[11]1.5
Western Gas Processors—Baker, Fallon Co., sw4 sw4 6-7n-60e	2.5	2.0	3	....	10.0	1.9	....	6.4	2.5	1.4	....
Total	**70.0**	**38.1**		....	**45.8**	**1.9**	**8.5**	**22.6**	**29.9**	**8.6**	**2.7**

NEBRASKA

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Cities Service Oil and Gas Corp.—Kimball, Kimball Co., 10-12n-55w	1.5	0.8	3	....	....	....	....	....	4.0	....	....
Marathon Oil Co.—West Sidney, Cheyenne Co., 4-12n-50w	12.0	2.3	2	....	2.8	....	2.0	....	....	1.7	....
Total	**13.5**	**3.1**		....	**2.8**	....	**2.0**	....	**4.0**	**1.7**	....

NEW MEXICO

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Amoco Production Co.—*Empire Abo, Eddy Co., 3-18s-27e	42.0	40.0	7	78.4	47.9	....	21.5	....	....	22.1	....
Cabot Corp.—Hobbs, Lea Co., 28-18s-36e	61.0	20.2	7	....	....	....	....	....	39.0	....	....
Cities Service Oil and Gas Corp.—Abo, Eddy Co., 35-17s-27e	4.0	3.0	7	....	....	....	....	....	6.0	....	....
Bluitt, Roosevelt Co., 15-8s-36e	25.0	25.0	7	....	....	....	....	....	120.0	....	....
Burton Flats, Eddy Co., 14-20s-28e NMPM	8.0	3.0	7	....	....	....	....	....	9.0	....	....
Conoco Inc.—Maljamar, Lea Co., sw se 21-17s-32e	50.0	20.0	7	42.5	36.6	5.2	12.2	....	....	9.7	[11]4.1
El Paso Natural Gas Co.—Blanco, San Juan Co., n2-n2 14-29n-11w	558.0	377.6	1	....	....	....	....	....	316.6	....	....
Chaco, San Juan Co., sw4 16-26n-12w	594.0	416.6	2	....	....	....	....	....	600.9	....	....
Jal No. 3, Lea Co., nw4-sw4 33-24s-37e	225.0	101.8	2	....	....	....	....	....	124.8	....	....
Jal No. 4A, Lea Co., se4-se4 31-23s-37e and s2-sw4 32-23s-37e	185.0	87.4	1	....	....	....	....	....	65.2	....	....
Jal No. 4B, Lea Co., se4-se4 31-23s-37e and s2-sw4 32-23s-37e	....	....	†	....	(54.0)	....	(61.7)	....	....	(74.4)	....
San Juan Co., 1-29n-15w	71.0	33.6	1	....	4.5	....	6.4	....	....	6.6	....
Wingate, McKinley Co., 16&17-15n-17w	....	....	†	....	(336.0)	(92.2)	(177.5)	....	....	(230.5)	....
Marathon Oil Co.—Indian Basin, Eddy Co., 23-21s-23e	210.0	95.9	7	....	....	....	....	....	158.7	....	....
Mesa Limited Partnership—South Blanco Creek, 6-7w-23n	6.0	2.1	3	....	....	....	....	....	10.8	....	....
Minerals Inc.—Hobbs, Lea Co., sw¼-sw¼-ne¼ 36-18s-36e	45.0	31.0	7	....	....	....	..	47.2	....	....	....
Kermac, Eddy Co., 12 4-21s-31e	6.0	3.0	6	....	....	....	....	1.5	....	....	....
Navajo Refined Helium—San Juan Co., se¼ 28n-18w	6.0	5.0	6-7	....	....	....	....	....	....	....	‡300
Northern Natural Gas Co.—Hobbs, Lea Co., 6-19s-37e	220.0	89.6	2	....	....	....	....	....	132.3	....	....
Phillips Petroleum Co.—Artesia, Eddy Co., s2 se4 7-18s-28e	43.0	NR	7	....	....	....	....	....	....	....	....
Eunice, Lea Co., ne4 3-22s-37e	80.0	NR	7	....	....	....	....	....	....	....	....
Lee, Lea Co., sw4 se4 30 nw4-ne4-31-17s-35e	35.0	NR	7	....	....	....	....	....	....	....	....
Lusk, Lea Co., nw4 ne4 19-19s-32e	60.0	NR	2	....	....	....	....	....	....	....	....
Southern Union Processing Co.—Kutz No. 1, San Juan Co., nw4 13-28n-11w	100.0	87.5	2	....	....	....	....	....	151.6	....	....
Kutz No. 2, San Juan Co., nw4 13-28n-11w	85.0	18.1	7	....	....	....	....	....	38.9	....	....
Lybrook, Rio Arriba Co., nw¼ 14-23n-7w	85.0	50.6	7	....	....	....	....	....	84.9	....	....
Texaco—Buckeye, Lea Co., se¼ of se¼ 36-17s&18s-34e, I mi se of Buckeye	25.0	6.7	6	....	....	....	....	....	71.6	....	....
Eunice No. 1, Lea Co., 27-22s-37e	105.0	73.8	7	176.3	108.1	14.6	32.8	....	....	48.7	[11]3.5
Tipperary Corp.—Denton, Lea Co., 2-7-155-37e	15.0	4.0	7	....	....	....	....	....	35.0	....	....
Warren Petroleum Co.—Eunice, Lea Co., ne4 3-22s-37e	NR	49.2	7	....	....	....	....	....	246.5	....	....
Monument, Lea Co., sw4 36-19s-36e	NR	51.9	7	....	....	....	....	....	217.8	....	....
Saunders, Lea Co., 34-14s-33e	NR	29.1	6	....	....	....	....	....	205.1	....	....
Snyder Ranch, Eddy Co., sw4-sw4 15-19s-31e	NR	12.0	7	....	....	....	....	....	19.8	....	....
Vada, Lea Co., sw2-sw4-nw4 23-10s-33e	NR	12.0	6	....	....	....	....	....	76.8	....	....
Total	**3,141.6**	**1,924.1**		**297.2**	**197.1**	**19.8**	**72.9**	**48.7**	**2,731.3**	**87.1**	**7.6**

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†Fractionation. (Figures in parenthesis do not represent primary production, and are not added in state totals). ‡Helium—MMcfd.

NORTH DAKOTA

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Cenex—Coyote Creek, Bowman Co., 27-131n-104w	3.0	0.8	2	....	1.1	....	3.1	....	....	....	....
Cities Service Oil and Gas Corp.—Lignite, Burke Co., nw4 7-162n-91w	11.0	8.0	2	....	13.0	....	8.0	....	....	7.0	....
Ecological Engineering Systems Inc.—Alexander, McKenzie, e½ sw¼ sw¼ 18-152n-101w	6.0	4.0	3	....	....	....	....	....	....	....	[11]2.6
Temple, Williams Co., Lot 4, 30-159n-95w	4.0	1.0	3	....	....	....	....	....	3.2	....	[11]0.3
Kerr-McGee Corp.—Boxcar Butte, McKenzie Co., 51-148n-102w	6.0	NR	3	....	7.9	....	4.5	....	....	2.6	....
Koch Hydrocarbon Co.—Grasslands, McKenzie Co., 36-148n-105w	60.0	41.2	7	....	68.5	....	47.1	....	....	35.9	....
Phillips Petroleum Co.—Tioga, Williams Co., 26-157n-95w	105.0	NR	2	....	....	....	....	....	....	....	....
True Oil Co.—Red Wing Creek, McKenzie Co., ne 27-148n-101w	10.0	2.5	2	....	5.3	....	....	12.2	....	....	....
Warren Petroleum Co.—Little Knife, Dunn Co., 16-141n-98w	NR	31.5	7	....	....	....	....	....	118.0	....	....
Western Gas Processors Ltd.—Teddy Roosevelt, Billings Co., nw4-ne4 16-142n-99w	40.0	20.0	2&7	75.2	43.2	....	30.5	....	....	37.6	[11]10.8
Total	**284.3**	**197.8**		**75.2**	**139.0**	....	**93.2**	**12.2**	**121.2**	**83.1**	**13.7**

OKLAHOMA

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Amoco Production Co.—Elmwood, Beaver Co., 24-2n-24ecm	80.0	18.9	2	....	....	....	....	....	40.4	....	....
Hitchcock-Okeene, Blaine Co., 13-17n-11w	55.0	38.2	7	....	....	....	....	....	70.2	....	[11]0.9
Mooreland, Woodward Co., 30-23n-18w	145.0	63.3	7	....	....	....	....	....	140.1	....	[11]5.4
North Okarche, Kingfisher Co., 8-15n-7w	25.0	3.2	5	....	....	....	....	....	....	0.2	....
Star Lacey, Blaine Co., 2-19n-10w	20.0	1.3	2	....	....	....	....	....	2.3	....	....
Anadarko Production Co.—Beaver Co., se 25-6n-21ecm	10.0	3.2	7	....	....	....	....	....	4.4	....	....
North Richland Center, Texas Co., 33-6n-12ecm	25.0	8.7	2	....	9.8	....	....	....	8.1	....	....
ANR Production Co.—Custer Co., ne4 5-13n-17w	200.0	140.0	7	....	....	....	....	....	171.6	....	....
Arco Oil & Gas Co.—Blackwell, Kay Co., 9-27n-1w	0.5	0.2	3	0.1	0.1	<0.1	0.1	....	....	0.2	<[11]0.1
Covington, Garfield Co., w2-sw4 19-22n-3w	15.0	12.0	7	13.2	15.9	2.5	6.7	....	....	9.0	[11]0.2
Drumright, Creek Co., nw4 sw4 28-18n-7e	15.0	6.0	1	....	13.6	2.3	6.9	....	....	12.2	[11]0.7
Mannford, Creek Co., w ne 30-18n-9e	10.0	2.1	3	0.7	2.5	0.5	1.2	....	....	1.4	....
Northwest Stillwater, Noble Co., n2 nw-ne ne 25-20n-1e	3.0	3.1	3	1.3	2.6	0.5	1.6	....	....	2.1	....
Seminole Co., sw4-ne4 10-8n-6e	20.0	9.1	1	....	22.3	2.3	7.9	....	....	12.2	[11]0.6
Southeast Flynn, Garfield Co., se-se 8-20n-5w	12.0	3.9	3	3.4	4.0	0.7	1.9	....	....	2.7	[11]0.1
Tecumseh, Pottawatomi Co., sw¼ 36-9n-3e	5.0	1.6	3	....	2.1	0.4	1.1	....	....	1.3	....
Arkla Inc.—Elk City, Beckham Co., 2-10n-21w	10.0	0.5	5	....	....	....	....	....	....	0.1	....
Beard Oil Co.—Choctaw, Oklahoma Co., 23 12n-1w	3.0	1.0	3	....	....	....	....	....	2.4	....	....
Bentley, Payne Co., 22-18n-1e	1.0	0.3	3	....	....	....	....	....	0.3	....	....
Cabot Corp.—Beaver Co., 25-5n-23ecm	20.0	9.9	7	....	....	....	....	....	30.2	....	....
Champlin Petroleum Co.—Enid, Garfield Co., 34-23n-6w	36.0	22.7	2	....	....	....	....	....	75.0	8.3	....
West Edmond, Logan Co., 21-4n-15w	22.0	18.2	6	....	....	....	....	....	78.5	....	....
Cities Service Oil and Gas Corp.—Ambrose, Kay Co., sw4 9-27n-1w	400.0	190.0	2	....	87.0	8.0	37.0	....	....	31.0	[5]10.0
Garrett, Kay Co., ne4-ne4 34-27n-1e	12.0	4.8	4	....	....	....	....	....	14.6	....	....
Murdock, Texas Co., 32-5n-16ecm	40.0	8.0	7	....	....	....	....	....	25.0	....	....
Rodman, Garfield Co., 27-20n-8w	50.0	37.0	7	....	....	....	....	....	124.0	....	....
CNG Producing Co.—Southwest Davis, 15-15s-1e	2.0	0.8	3	....	....	....	....	....	3.4	....	....
Colorado Interstate Gas Co.—Keyes, Cimarron, e2 of se4 17-5n-7e	50.0	16.0	3	....	....	....	....	....	3.1	....	....
Conoco Inc.—Cashion, Kingfisher Co., ne ne - 9-15n-5w	30.0	25.2	7	21.3	29.7	4.0	11.8	....	....	13.6	[11]1.1
Clinton, Custer Co., sw 26-12n-16w	75.0	61.6	7	56.7	34.6	6.4	8.2	....	....	10.2	[11]<0.1
Hennessey, Kingfisher Co., nw nw 36-19n-7w	30.0	29.8	7	21.5	19.4	2.5	6.8	....	....	7.0	[11]0.7
Mustang, Grady Co., 30-10n-5w	30.0	14.2	7	8.4	6.5	1.0	2.5	....	....	3.2	[11]<0.1
Damson Gas Processing Corp.—Hooker, Texas Co., 8-4n-17e	70.0	32.0	7	....	....	....	....	....	95.0	....	....
Deisenroth Gas Products Inc.—Okemah, Okfuskee Co., 23-11n-93	1.0	0.5	1	....	....	....	....	....	2.2	....	....
El Paso Natural Gas Co.—Beaver Co., se4-ne4 18-3n-26e	40.0	21.6	3	....	....	....	....	....	19.6	....	....
Enserch Processing Partners Ltd.—Katie, Garvin Co., 36-2n-2w	20.0	4.1	1	....	....	....	....	....	8.4	....	....
Wallville, Garvin Co., 27-4n-3w	6.0	5.6	2	....	....	....	....	....	7.6	....	....
Exxon Co.—Camargo, Dewey Co., 10-18n-19w	15.0	7.6	2	....	....	....	....	....	14.9	....	....
Dover-Hennessey, Kingfisher Co., 1-18n-7w	80.0	51.0	7	....	....	....	....	....	235.7	....	....
Gulf Energy Processing Corp..—Antioch, Garvin Co., 17-3n-2w	10.0	6.7	3	....	....	....	....	15.5	....	....	....
East Guthrie, Logan Co., 3-15n-1w	5.0	2.6	3	....	....	....	....	4.2	....	....	....
Pauls Valley, Garvin Co., 12-3n-1w	0.7	0.6	3	....	....	....	....	1.6	....	....	....
West Guthrie, Logan Co., 30-15n-2w	10.0	14.4	3	....	....	....	....	29.4	....	....	....
Kerr-McGee Corp.—Milfay, Creek Co., 21-15n-7e	12.0	NR	2	....	6.3	....	3.3	....	4.4	....	....
Koch Hydrocarbon Co.—Fitts, Pontotoc Co., 30-2n-7e	12.0	1.5	3	....	1.8	....	....	....	4.3	....	....

Company, plant, location	MMcfd Gas capacity	 Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	 Prop.	 Isobut.	 Normal or unsplit butane	 LP-gas mix	 Raw NGL mix	 Debut. nat. gaso.	 Other
Ladd Petroleum Corp.—Beaver Co., 30 4n-20ecm	40.0	36.0	7	....	....	....	....	....	71.0	....	....
McMoRan Oil & Gas Co.—Tyrone, Texas Co., sw¼ 19-6n-19 ecm	36.0	25.9	7	....	....	....	....	....	62.9	....	....
Mobil Oil Corp.—Chitwood, Grady Co., 34-5n-6w	90.0	37.3	7	....	....	....	....	....	107.7	....	[9]6.0
NE Trail, Dewey Co., 1-17n-18w	24.0	14.0	2	....	9.4	....	....	....	22.3	....	[9]2.2
Postle Hough, Texas Co., 13-5n-13ecm	18.5	2.7	2	....	....	....	....	....	13.8	....	[9]0.4
*Putnam-Oswego, Dewey Co., 35-16n-16w	50.0	41.4	7	....	....	....	....	....	55.1	....	[9]0.4
Seiling, Woodward Co., 32-20n-17w	20.0	1.4	3	(All products fractionated at NE Trail)							
Sholem Alechem, Stephens Co., 2-1s-4w	70.0	43.9	7	....	57.8	....	24.5	....	42.9	28.7	[9]1.1
West Putnam, Dewey Co., 9-17n-17w	11.0	1.2	3	(All products fractionated at NE Trail)							
Mustang Gas Products Co.—Calumet, Canadian Co., ne4 28-14n-9w	250.0	116.0	2	....	56.0	¶48.7	....	....	....	....	....
Dibble, McClain Co., 35-7n-4w	3.0	2.5	3	....	....	....	....	....	6.0	....	....
Edmond, Okla. Co., 32-14n-4w	15.0	13.5	7	....	....	....	....	....	45.0	....	....
Henryetta, Okmulgee Co., 33-13n-12e	10.0	10.0	3	....	....	....	....	....	17.0	....	....
Oklahoma Gas Pipeline Co.—Tyrone, Texas Co., sw¼ 11-6n-18e	60.0	30.0	7	5.7	14.5	3.1	7.3	....	....	9.1	....
Phillips Petroleum Co.—Aline, Alfalfa Co., 7-23n-11w	45.0	NR	2	....	....	....	....	....	....	....	....
Bradley, Garvin Co., ne4 nw4 18-4n-4w	140.0	NR	1	....	....	....	....	....	....	....	....
Cimarron, Woodward Co., e2 ne4 27-20n-17w	56.0	NR	7	....	....	....	....	....	....	....	....
Creek, Tulsa Co., s2 sw4 nw4 7-17n-13e	25.0	NR	7	....	....	....	....	....	....	....	....
Fox, Carter, Co., 28-2s-3w	70.0	NR	7	....	....	....	....	....	....	....	....
Kingfisher Co., nw4 sw4 9-15n-5w	175.0	NR	7	....	....	....	....	....	....	....	....
Lucien, Noble Co., 18-20n-2w	22.0	NR	3&7	....	....	....	....	....	....	....	....
Norge, Grady Co., ne4 3-6n-8w	27.0	NR	3	....	....	....	....	....	....	....	....
Okarche, Kingfisher Co., se4 ne4 31-15n-8w	150.0	NR	7	....	....	....	....	....	....	....	....
Osage Co., se4 32-26n-7e	15.0	NR	3	....	....	....	....	....	....	....	....
Seiling, Dewey Co.	75.0	NR	7	....	....	....	....	....	....	....	....
Sooner No. 1, Major Co., se4 se4 17-20n-9w	12.0	NR	3	....	....	....	....	....	....	....	....
Pioneer Gas Products Co.—Binger, Caddo Co., 26-10n-11w	15.0	6.3	7	....	....	....	....	....	27.1	....	....
Madill, Marshall Co., 32-7e-5s	20.0	19.9	2	....	24.2	2.3	7.9	....	....	8.1	....
Ringwood, Major Co., 11-22n-10w	80.0	51.0	2&7	....	....	....	....	....	144.9	....	....
Shell Western E&P Inc.—Elk City, Beckham Co., 15-10n-21w	4.5	2.0	3	1.5	3.2	....	....	6.1	....	....	....
Standard Oil Production Co.—Crescent, Logan Co., nw 34-17n-4w	45.0	33.0	6	....	....	....	....	168.0	....	....	....
*Elmore, Garvin Co., 17-1n-2w	30.0	30.0	7	....	6.5	....	6.5	....	....	11.0	[5]45.0
Marshall, Garfield Co., nw 24-20n-4w	15.0	10.0	7	....	....	....	....	50.0	....	....	....
Sun Exploration & Production Co.—Carney, Lincoln Co., 12-15n-2e	15.0	17.8	7	....	....	....	....	....	55.1	....	....
Goldsby Central, McClain Co., 3-7n-3w	65.0	41.5	7	....	....	....	....	....	180.5	....	....
Laverne, Harper Co., 20-26n-25w	200.0	83.2	7	....	38.2	10.2	22.0	....	....	28.9	[5]136.4 [11]6.2
Newcastle, Grady Co.	NR	6.4	2	....	5.7	....	....	....	5.1	....	....
Wakita, Grant Co., 5-27n-7w	15.0	15.1	2	....	....	....	....	....	37.5	....	[11]2.5
Texaco Inc.—Camrick, Beaver Co., 31-1n-20 ecm	14.0	7.4	7	....	....		....	....	32.2	....	....
*East Velma Middle Block, Stephens Co., 1-2s-4w	30.0	18.4	2	....	....	....	....	....	....	....	....
Enville, Love Co., 7-7s-3e	15.0	10.4	7	....	....	....	....	....	31.3	....	....
Kellyville, Creek Co., ne 27-17n-10e	15.0	1.0	6	....	....	....	....	....	7.8	....	....
Velma, Stephens Co., 23-ls-5w	100.0	48.1	7	....	....	....	....	....	225.5	....	....
Texas Oil & Gas Corp.—Antelope Hills, Roger Mills Co., 30-16n-24w	50.0	48.2	7	....	....	....	....	....	91.0	....	[11]0.6
Beaver Co., 9-1n-27e	75.0	22.4	7	....	....	....	....	....	48.2	....	[11]0.8
Cimarron, Blaine Co., nw4 24-18n-13w	90.0	59.2	7	....	....	....	....	....	129.2	....	[11]1.7
Custer Co., sw4 nw4 34-14n-16w	115.0	72.8	2&7	....	....	....	....	....	165.1	....	[11]0.6
El Reno, Canadian Co., nw4 sw4 33-14n-7w	75.0	56.5	7	....	....	....	....	....	145.3	....	[11]4.2
Jeffries, Major Co., sw4 nw4 19-23n-12w	20.0	5.1	2	....	....	....	....	....	6.3	....	....
Stephens So., 14-1s-5w	25.0	3.6	7	....	....	....	....	....	6.6	....	....
Watonga, Kingfisher Co., w2 se4 35-15n-9w	40.0	11.0	7	....	....	....	....	....	27.8	....	[11]1.1
Woodward Co., sw4 nw4 29-23n-21w	75.0	9.4	7	....	....	....	....	....	19.6	....	[11]1.9
Union Texas Petroleum Corp.—Chaney Dell, Major Co., 35-23n-10w	130.0	116.0	2&7	90.4	110.0	17.4	41.9	....	....	39.4	[11]31.7
Chester, Woodward Co., 2-20n-17w	25.0	6.8	7	3.9	3.0	0.6	1.4	....	....	1.5	[11]0.3
Lamont, Grant Co., 19-26n-3w	37.0	30.2	2&7	31.9	31.6	4.6	12.2	....	....	11.7	[11]2.0
Unocal—Caddo, Carter Co., 23-36-1e	10.0	5.4	3	....	7.1	....	....	....	5.9	....	....
Valero Hydrocarbons Co.—Elk City, Beckham Co., 15-10n-21w	50.0	40.3	7	5.1	8.9	1.8	3.3	....	3.0	....	....
Tecumseh, Pottawatomie Co., ne4 29-10n-3e	14.1	14.0	3	8.5	13.6	2.0	6.5	....	5.7	....	....
Warren Petroleum Co.—Kingfisher Co., 11-15n-9w	NR	6.9	7	....	....	....	....	....	18.0	....	....
Knox, Grady Co., 33-3n-5w	NR	15.9	2	....	4.3	....	....	....	13.5	....	[11]9.5
Leedey, Roger Mills Co., 32-16n-21w	NR	33.8	7	....	....	....	....	....	111.0	....	....
Maysville, Garvin Co., 18-4n-2w	NR	81.5	7	141.1	111.6	9.4	37.2	....	....	38.3	[8]2.2
Mocane, Beaver Co., 18-5n-25e ecm	NR	45.7	2	....	....	....	....	....	99.5	....	
Total	**4,989.8**	**2,898.2**		**414.7**	**763.8**	**131.2**	**267.7**	**274.8**	**3,272.1**	**291.4**	**276.5**

¶Isobutane and C_4+.

TEXAS

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Adobe Resources Corp.—Apple Creek, Glasscock Co., 7-32-4s	30.0	16.8	7	....	....	....	....	....	91.5	....	....
Sale Ranch, Martin Co., 23-37-1n	16.0	10.5	2	....	....	....	....	....	76.6	....	....
Amoco Gas Co.—Texas City, Galveston Co., 1.814 acre tract in John Grant A-72	60.0	54.9	7	....	....	....	....	....	16.2	....	[5]18.0

Company, plant, location	MMcfd Gas capacity	Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Amoco Production Co.—*Burnell-North Pettus, Bee Co., A-591	30.0	13.4	7	....	....	....	....	....	16.5	....	[11]1.0
Edgewood, Van Zandt Co., 2. Roberts A-702	60.0	45.3	2	....	17.1	....	21.7	....	....	12.0	[11]62.2
Hastings, Brazoria Co., 1-ACH-DA-416	70.0	62.2	7	....	....	....	....	....	16.4	....	[5]10.1
Luby, Nueces Co., Canutillo Colony Dutch Co.	20.0	17.1	7	....	....	....	....	....	20.4	....	....
Mallett CO_2 removal, Hockley Co., Labors 16, 17 League 49 Scavey Co. School Land	100.0	8.0	3	....	....	....	....	....	....	5.6	....
Midland Farms, Andrews Co., 842-T-T-N G&MMB&A	15.0	21.5	7	....	....	....	....	....	115.0	....	[11]0.9
Monahans, Winkler Co., 24-10 PSL	5.0	4.9	3	....	....	....	....	....	12.0	....	....
North Cowden, Ector Co., 34-5-43-1M T&P RR	25.0	17.1	7	....	42.9	....	20.3	....	17.4	18.0	[5]47.5 [10]0.2
Old Ocean, Brazoria Co., Charles Breen League A-46	175.0	129.5	7	61.5	47.5	12.7	12.4	....	....	54.1	....
Slaughter, Hockley Co., 14-15-59 Edwards & Scurry CSL	57.0	51.8	7	....	105.3	....	87.9	....	....	68.3	[5]223.2
South Fullerton, Andrews Co., 8-A 48 PSL	10.0	8.4	7	....	....	....	....	....	84.2	....	[10]0.5
West Yantis, Wood Co., 3 Oscar Engledon A-181	20.0	8.6	3	....	....	....	....	....	....	....	[11]39.9
Anchor Gasoline Corp.—Tabasco, Hidalgo Co., nw corner of Tract 322, Las Ejidas de Reynosa Vieja Grant	67.0	NR	1	....	....	....	....	2.3	....	0.4	....
Arco Oil and Gas Co.—*Block 31, Crane Co., 33-31 Univ. Lands	265.0	307.5	2&7	223.3	164.2	....	93.1	....	....	69.6	....
*Crane, Upton Co., 128-D CCS&RR Co	15.0	6.8	3	6.3	6.5	1.0	2.9	....	....	3.5	<[11]0.1
Crittenden, Winkler Co., 24-C23-PSL	50.0	9.8	7	11.5	5.0	1.1	1.4	....	....	2.4	....
El Dorado, Schleicher Co., 81-TT-TC RR	15.0	14.4	7	31.8	24.4	4.3	9.4	....	....	7.3	[11]5.0
Fashing, Atascosa & Karnes Co., 131 Wm. Smith	12.0	4.5	5	....	0.2	....	0.3	....	....	0.8	....
Hull, Liberty Co., Wm. Smith A-342	18.0	3.6	2	....	1.0	....	0.7	....	....	1.1	[11]0.1
Longview, Gregg Co., J. Moseley	35.0	9.2	6	43.1	62.8	40.3	....	....	....	30.0	[11]1.4
Midland Co., 17-40-4s T&PRR	12.0	7.4	3	5.0	5.8	0.9	2.7	....	....	3.1	[11]0.1
Nueces River, Live Oak Co., Cameron CSL 32-A-34	90.0	32.7	2	....	19.9	11.7	....	....	....	9.7	....
Price, Rusk Co., George W. Brooks A-4	15.0	5.2	1	0.2	3.1	....	4.0	....	....	6.7	[11]0.5
Refugio Co., 48&48A Coleman Fulton Pasture Land	6.5	1.4	3	....	....	....	....	....	....	....	[11]0.4
Silsbee, Hardin Co., George W. Brooks A-4	15.0	3.8	7	6.5	9.4	2.3	2.8	....	....	2.9	[11]0.1
Taft, San Patricio Co., Coleman Fulton Pasture Land	40.0	14.6	2	....	3.3	....	2.6	....	....	3.1	[11]0.4
Arkla Inc.—*Jefferson, Marion Co., Heirs of John Hanks A-188	3.5	0.9	5	....	....	....	....	....	....	0.3	....
Waskom, Harrison Co., J. Blair	125.0	65.2	1	....	8.9	4.1	6.2	....	....	19.1	[3]0.5 [4]0.8 [6]0.2 [10]0.5
Willow Springs, Gregg Co., P. P. Rains	20.0	6.9	5	....	....	....	....	....	....	1.2	....
Black Hawk Gasoline Corp.—Jack Co., R. Stanton, A-1329	2.0	1.0	3&4	....	....	....	....	1.5	....	....	....
Breckenridge Gasoline Co.— Lodi, Cass Co., Wm. R. Meyer A-166	7.0	5.8	1	....	....	....	....	....	5.7	....	....
Cabot Corp.—Arrington, Hemphill Co., 62-A-2 H&GNRR	40.0	12.2	2	....	....	....	....	....	26.5	....	....
Carson Co., 4-5-I&GN	20.0	11.9	7	....	....	....	....	....	43.3	....	....
East Goldsmith, Ector Co., 44-34, 1n,T&PRR	35.0	10.2	5&7	....	....	....	....	....	33.0	....	....
Estes, Ward Co., 3-16 Univ. Land	12.8	11.5	7	....	....	....	....	....	66.5	....	....
Gray Co., 152-3 I&GN	20.0	13.5	7	....	....	....	....	....	71.0	....	....
Kingsmill, Gray Co., 152-3-I&GN	24.5	18.4	7	....	....	....	....	....	88.4	....	....
Levelland, Hockley Co., 14-43, Rains County School Land	15.0	9.6	7	....	....	....	....	....	25.1	....	....
Pampa, Gray Co., 96 B-2 H&GN	28.0	10.4	2	....	17.4	....	....	21.0	....	....	....
Sweetwater, Nolan Co., sw corner 9 T&PRR Z D-438	150.0	11.2	7	....	....	....	....	....	12.0	....	....
Turkey Creek, Potter Co., 36-M20-G&M	60.0	20.9	2	....	....	....	....	....	59.9	....	....
Walton, Winkler Co., 11-26 PSL	33.5	27.7	7	....	....	....	....	....	93.1	....	....
Yake-Merchant, Moore Co., nw corner of JW Procter survey	10.0	4.2	6	....	....	....	....	....	22.0	....	....
Cal Gas Corp.—Live Oak Co., se part C&M RR No. 1131	15.0	16.8	7	3.2	12.8	3.2	4.0	....	....	6.6	....
Strawn, Tom Green Co.	5.0	3.2	6	5.2	5.3	0.9	2.2	....	....	2.4	....
Champlin Petroleum Co.—Bryan, Brazos	35.0	27.2	6	....	....	....	....	....	94.9	....	....
Conger, Glasscock Co.	7.0	5.0	3	....	....	....	....	....	6.9	....	....
Conroe, Montgomery Co.	65.0	54.8	7	....	....	....	....	....	73.0	....	....
East Texas, Panola Co.	380.0	302.4	7	243.6	112.6	....	82.2	....	64.9	163.3	....
Gulf Plains, Nueces	135.0	64.2	7	69.4	29.9	....	18.2	....	....	41.6	....
Lyons 1 & 2, Burleson Co.	35.0	18.2	3	....	....	....	....	....	68.9	....	....
Tunis, Burleson Co.	15.0	8.3	3	....	....	....	....	....	37.5	....	....
Chevron USA Inc.—Kermit, Winkler Co., 12-B3 PSL	50.0	9.0	2	....	5.8	....	2.6	....	....	5.2	....
Sherman, Grayson Co., A-121 Uriah Burns	33.0	16.0	2	....	10.0	....	....	10.7	....	5.3	....
North Snyder, Scurry Co., 440-97 H&TC RR	46.0	26.0	3	....	....	....	19.4	....	87.5	26.8	[5]36.9
Cities Service Oil and Gas Corp.—Chico, Wise Co., 3 GH&HRR A-384	100.0	84.0	7	....	....	....	....	....	515.0	....	[11]7.0
Corpus Bay, San Patricio Co., Lot 9 Gregory subdiv. Geronimo Valdez A-269	30.0	20.0	2	....	....	....	....	....	20.0	....	....
East Texas, Gregg Co., William Castleberry A-38	27.0	22.0	7	....	....	....	....	90.0	....	....	[5]114.0
*Ector Co., T&PRR 44-2s-28	4.0	2.0	6	....	....	....	....	....	4.0	....	....
Gulf Coast fractionation, Chambers Co., Henry Griffin, League A-12	....	....	†	(823.0)	(776.0)	(165.0)	(374.0)	....	....	(364.0)	....
Lefors, Gray Co., 2-1-ACH&B	12.0	10.0	7	....	....	....	....	93.0	....	....	....

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
May, Kleberg Co., 12-5 Theo. F. Kochs first subdiv., Riviera Lands, Gabriel Trevion A-232	30.0	2.4	2	....	....	....	....	....	2.4	....	....
Mont Belvieu fractionation, Chambers Co., Henry Griffin, League A-12	....	....	†	(803.0)	(729.0)	(128.0)	(325.0)	....	....	(287.0)	....
Myrtle Springs, Van Zandt Co., J. Salingua A-765	30.0	18.0	2	....	16.0	....	15.0	....	....	8.0	[11]84.0
*Roberts Ranch, Midland Co., 16-41-3s T&PRR	85.0	67.0	7	....	....	....	....	....	187.0	....	....
Robstown, Nueces Co , Puentecitas Andres de la Fuente A-III Simmons & Perry's subdiv. 7	8.0	6.0	7	....	....	....	....	....	11.0	....	....
Stonewall Co., Elijah Boren A-831	12.0	6.0	1	....	16.0	....	9.0	....	....	9.0	....
Welch, Dawson Co., 67-M of EL&RRRR	3.0	1.3	2	....	....	....	....	....	15.0	....	....
*West Seminole, Gaines Co., 355 G CCDS&RGN GRR	30.0	25.0	7	....	....	....	....	....	105.0	....	....
West World, Crockett Co., 19-Q-GCSFRR	15.0	0.5	2	....	....	....	....	....	2.5	....	....
Conoco Inc.—Chittim, Maurice Co., 35-6	5.0	1.7	3	....	4.4	....	5.7	....	....	3.7	....
Hamlin, Fisher Co., 9-R-26	14.0	10.0	7	17.3	18.2	2.8	7.0	....	....	7.1	[11]0.1
Ramsey, Reeves Co., nw½ 36-58-1	10.0	7.7	6	....	10.0	....	6.3	....	....	6.2	....
Damson Gas Processing Corp.—Brazos River, Young Co., J. Garrett	....	....	†	(0.5)	(8.0)	....	(4.0)	....	....	(4.0)	....
Caddo, Stephens Co., 77 T&P RR 5	1.0	0.8	4	....	....	....	....	....	4.0	....	....
Canadian, Hemphill Co.	3.0	0.8	3	....	....	....	....	....	1.8	....	....
Cargray, Carson Co., 46-4 I&GN	30.0	14.0	7	25.0	20.0	....	....	....	32.0	....	....
Ibex, Shackelford Co., nw¼ 28 BAL	10.0	5.0	1	....	....	....	....	....	....	....	....
Nueces, Tract 18, Map 153	30.0	6.0	3	....	....	....	....	....	....	....	....
South Bend, Young Co., J. Garrett	10.0	6.0	1	....	10.0	...	3.5	....	....	6.0	....
Sterling Co., 10-22 H&TC	30.0	26.0	7	....	....	....	....	....	130.0	....	....
Texon, Reagan Co., 12-2 Univ. Land	3.0	2.0	4	....	....	....	....	....	....	....	....
Woodlawn, Harrison Co.	100.0	20.0	1	....	....	....	....	....	35.0	....	....
Davis Gas Processing Inc.—Big Lake, Reagan Co., 8 miles e of Big Lake	11.0	7.5	2	....	....	....	....	....	42.0	....	....
Bowie, Montague Co., 3 miles ne of Bowie	8.0	3.5	3	....	7.0	....	....	....	8.0	....	....
Concho, Concho Co., 4 miles s of Paint Rock	10.0	3.0	2	....	3.0	....	....	....	3.0	....	....
DeWees, Wilson Co., 10 miles sw of Floresville	2.0	0.5	3	....	....	....	....	....	1.0	....	....
Irion (Rocker B-2), Irion Co., 8 miles n of Barnhart	16.0	8.0	2	....	....	....	....	....	48.0	....	....
Kosciusko, Wilson Co., 1 mile n of Kosciusko	8.0	3.0	3	....	....	....	....	....	5.0	....	....
Neleh, 5 miles sw of McCamey	6.0	3.5	2	(Gas processed at Shell's Tippett plant)							
Ozona, Crockett Co., 13 miles sw of Ozona	5.0	2.0	3	....	....	....	....	....	4.0	....	....
Stiles, Reagan Co., 5 miles nw of Texon	8.0	4.0	2	....	....	....	....	....	24.0	....	....
Diamond Shamrock Corp.—McKee, Moore Co., 399-44 H&TC	375.0	237.1	2&7	....	219.3	45.1	87.7	....	73.7	....	[5]368.9
Eagle Petroleum Corp.—Eagle-Thriftway, Young Co.	1.5	0.5	3	....	....	....	....	....	2.0	....	....
Holliday No. 2, Archer Co.	1.5	0.5	3	....	....	....	....	....	2.5	....	....
El Paso Hydrocarbons Co.—Benedum, Upton Co., w2 46 Y MK&T RR	90.0	80.5	7	....	....	....	....	....	....	364.7	....
Foster, Ector Co., sw18-42-2s T&PRR	20.0	14.0	7	47.8	43.4	....	22.6	....	....	19.0	....
Ranger, Eastland Co., John P. Rohus A-415	10.0	6.7	3	....	....	....	....	....	64.0	....	....
Santa Rosa, Pecos Co., s2 105 8 H&GN RR	20.0	18.0	7	....	....	....	....	....	73.2	....	....
W.D. Noel, Eastland Co., se4 30-3 H&TC RR	10.0	..	3	....	....	....	....	....	3.2	....	....
W.D. Noel, Eastland Co., ne e2 ne4 31-3 H&TC RR	30.0	28.0	7	....	....	....	....	....	139.0	....	....
El Paso Natural Gas Co.—Midkiff, Reagan Co., nw4 n2 sw4-22 T&PRR 37-5-5	168.0	89.8	1	....	87.7	....	75.3	171.3	....	65.8	....
Wilshire, Upton Co., e2 ne4 ne4 & ne4 se4 ne4 135E CCSD & RGNG RR	30.0	19.8	4	....	....	....	....	....	3.5	....	....
Endevco Natural Gas Co.—Bear Wallow, Brazoria Co., Oliver Jones A-78	30.0	26.0	7	....	....	....	....	....	56.0	....	....
Cheyenne, Winkler Co., 15-L23 PSL	20.0	11.0	7	....	....	....	....	....	20.0	....	....
Clarkson, Sutton Co., 48-14-TW&MG	20.0	15.0	7	....	....	....	....	....	30.0	....	....
DeWitt, Fandango, Gun Point, Zapata plants	130.0	100.0	1	....	....	....	....	....	....	....	....
Iola, Grimes Co., RH Dunham A-184	30.0	24.0	7	....	....	....	....	....	75.0	....	....
Enserch Processing Partners Ltd.—Chico, Jack Co., J.U. Fields A-218	30.0	18.1	7	....	....	....	....	....	94.3	....	....
Decatur, Wise Co., David Moses A-357	18.0	11.3	7	....	....	....	....	....	47.7	....	....
Gilliland, Knox Co., C of H&TC RR	14.0	4.2	3	....	....	....	....	....	6.6	....	....
Gordon, Palo Pinto Co., Thomas Reed A-384	50.0	44.5	7	....	....	....	....	....	179.6	....	....
Madisonville, Madison Co., Alfred Gee A-16	20.0	13.4	5	....	....	....	....	....	1.9	....	....
Novice, Coleman Co., T&NO RR Co. 24-2	4.5	4.0	3	....	....	....	....	....	5.3	....	....
Pueblo, Eastland Co., SPRR-464	20.0	15.0	7	....	....	....	....	....	76.4	....	....
Ranger, Eastland Co., H&TC RR 4-4	18.0	21.4	3	....	....	....	....	....	71.7	....	....
Red Oak, Leon Co., A. T. Kerr A-455	10.0	1.8	4	....	....	....	....	....	0.4	....	....
Reprieve, Hardeman Co., L. Bechtgl, 2	3.0	1.7	3	....	....	....	....	....	6.2	....	....
Santa Anna, Coleman Co., Mary Ann Fisk 630, A-195	5.0	3.4	3	....	....	....	....	....	2.8	....	....
Springtown, Parker Co., J. L. Hodges A-690	80.0	49.5	7	....	....	....	....	....	170.0	....	....
Trinidad, Henderson Co., No. Addison A-17	65.0	67.1	7	....	....	....	....	....	114.9	....	....
Weatherford, Parker Co., A. Bieless A-2732	30.0	7.7	7	....	....	....	....	....	29.1	....	....
Exxon Co.—*Anahuac, Chambers Co., H&TCRR, 51 A-112	168.0	95.0	2	....	....	....	....	....	78.4	....	....
*Clear Lake, Harris Co., James Lindsey A-43	133.0	123.0	2	57.5	24.8	8.7	7.8	....	....	19.8	[11]1.7 [12]0.6
*Conroe, Montgomery Co., Ransom House	122.0	87.0	2&7	....	....	....	....	....	110.7	....	....
East Texas, Rusk, T. J. Martin	25.0	7.9	3&6	....	12.7	....	....	....	48.4	....	[5]35.7
Hawkins, Wood Co., H. Watson	115.0	112.0	2	18.1	41.1	20.7	27.4	....	....	62.0	....
Hawkins Cryogenic, Wood Co., H. Watson	40.0	24.0	7	8.2	8.3	3.0	4.2	....	....	7.1	....
Heyser, Calhoun Co., Agaton Sisneros A-36	30.0	25.0	7	....	....	....	....	....	32.5	....	[11]0.9
Katy, Waller Co., T. S. Reese 110, A-332	960.0	279.0	1	271.1	84.8	24.8	26.3	....	....	90.5	....

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Kelsey, Brooks Co., La Blanca A-459	165.0	24.0	2	....	....	....	....	....	48.1	....	....
King Ranch, Kleberg Co., R. King A-172	925.0	554.0	2	387.1	169.8	59.8	52.3	....	....	139.2	....
Neches, Cherokee Co., J. H. Shaw	30.0	30.0	2	....	....	....	....	....	63.0	....	....
Pyote, Ward Co., 32-16 ULS	100.0	33.0	7	....	....	....	....	....	44.1	....	....
Sabine Lake, Orange Co., Wm. A. Davis A-7	26.0	20.0	7	....	....	....	....	....	58.8	....	....
Sand Hills, Crane Co., 18-32 PSL	65.0	38.0	7	....	....	....	....	....	164.0	....	....
Santa Fe, Brooks Co., San Salvador del Tule A-290	35.0	5.0	2	....	....	....	....	....	6.1	....	....
Sarita, Kenedy Co., J. A. Balli A-2	95.0	57.0	7	....	....	....	....	....	69.7	....	....
Thompson, Fort Bend Co., John Rabb	30.0	24.0	7	....	....	....	....	....	9.7	....	....
Tomball, Harris Co., C. Goodrich	65.0	32.0	2	....	....	....	....	....	27.2	....	....
Tom O'Connor, Refugio Co., Maria Ximines A-324	165.0	138.0	7	....	....	....	....	....	172.5	....	[11]7.0
Farmland Industries Inc.—Bailey, Schleicher Co., 522-TT	15.0	0.9	7	....	....	....	....	....	50.0	....	....
Eldorado, Schleicher-Irion-Reagan Cos., 33-M-GH&SA	35.0	35.0	7	....	....	....	....	....	140.0	....	....
Mertzon, Schleicher-Irion-Tom Green Cos., Tom Green CSL-1	50.0	28.0	7	....	....	....	....	....	155.0	....	....
Quitman, Wood Co., S.G. Purse A-456	10.0	4.9	2	....	....	....	....	....	24.0	....	....
Fort Chadbourne Corp.—Box Elmdale, Callahan Co., 4 miles e of Abilene	4.0	2.0	3	....	....	....	....	....	4.0	....	....
Tuscola, Taylor Co., 2 miles w of Tuscola	4.0	2.0	3	....	....	....	....	....	4.0	....	....
Gerlane Petroleum Co.—Mobeetie, Wheeler Co., 1 mile w of Mobeetie	12.0	3.0	2	....	....	....	....	....	6.0	....	....
Glen L. Martin—McLean-Bowman B, I&GN RR 55 A-275 Block 2, Dimmit Co.	1.0	0.4	3	....	....	....	....	....	0.5	....	....
Gulf Energy Processing Corp.—Palo Pinto Co., J.H. Brown A-1092	12.0	12.0	7	....	....	....	....	26.9	....	....	....
Rio Grande City, Starr Co., Share 24C, Portion 85, Camargo	38.0	33.3	2	....	1.8	....	1.4	....	....	1.1	....
*Rio Grande Dry Bed, Starr Co., Share 24C, Portion 85, Camargo Jurisdiction	140.0	44.4	5	....	....	....	....	1.9	....	....	....
*Runge, Karnes Co., Cabeza Creek area, Ramon Musquiz A-8	52.0	28.4	2	....	....	....	....	61.3	....	....	....
Houston Oil & Minerals Corp.—Giddings, Lee Co., J. Vashary League A-329	5.0	3.5	3	....	....	....	....	....	8.4	....	....
Madisonville, Madison Co., John Talbert A-30	1.0	0.8	4	....	....	....	....	....	1.2	....	....
Smith Point, Chambers Co., E. T. Branch A-40	105.0	38.0	5	....	....	....	....	....	....	6.6	....
South Liberty, Liberty So., E. Munson League A-88	18.0	10.0	3	....	....	....	....	....	2.0	....	....
Texas City Dike, Galveston Co., T. G. Western A-204	50.0	17.0	7	....	....	....	....	....	17.6	....	[5]20.0
Hunt Oil Co.—*Fairway, Henderson Co., Jose Mora A-497	87.5	70.0	2	....	....	....	....	....	177.2	....	....
*Pecos Valley, Pecos Co., 106-T&ST-L	10.0	2.8	3	....	....	....	....	....	2.3	....	....
Kerr-McGee Corp.—Chapel Hill #35, Smith Co., Stillwell Box A-169	35.0	30.0	7	....	22.0	....	15.0	....	....	20.0	....
Hobart Ranch, Hemphill Co., 70 A-2 N&GN	43.5	NR	7	....	....	....	....	....	68.5	....	....
Pampa, Gray Co., 163-3 I&GN	24.0	NR	2	....	....	....	....	....	34.3	....	....
Koch Hydrocarbon Co.—Sterling Co., 141-2 H&TC RA	5.0	3.0	3	....	....	....	....	....	12.9	....	....
Ladd Petroleum Corp.—Southwest Ozona, Crockett Co., 2-2 I&GN RR	25.0	24.0	2	17.2	21.4	3.6	9.2	....	....	....	[5]10.1 [11]8.2
Mapco Inc.—Bivins, Moore Co., 33-PMc, ELRR	100.0	4.6	2	....	....	....	....	....	12.1	....	....
Fritch 950, Hutchinson Co., 92-Y2-TTRR	60.0	44.0	2	....	....	....	....	....	151.0	....	....
Fritch 1000, Hutchinson Co., 92-Y2-TTRR	145.0	12.4	2	....	....	....	....	....	30.9	....	....
Marathon Oil Co.—Markham, Matagorda Co., 4-9-9	21.0	18.0	3	....	....	....	....	4.3	....	....	....
Susan Peak, Tom Green Co., 193 SPRR-11	3.3	2.9	3	....	3.6	....	....	3.6	....	....	....
Welder, San Patricio Co., 49 Robert Montgomery 199 and Ewan Cameron A-97	55.0	7.0	1	....	....	....	....	....	1.6	....	....
Yates, Pecos Co., I.G. Yates, 194 SF 1234-1	40.0	33.7	7	....	....	....	....	....	58.0	....	....
MidCon Texas Pipeline Corp.—Flatrock Creek, Young Co., M. Case A 1402	13.0	9.0	2	....	....	....	....	....	20.0	....	....
Graham, Young Co., TE&L Co., 3412 A-1232	8.0	4.0	2	....	....	....	....	....	10.0	....	....
Markley, Archer Co., A. Rohgus A-240	2.0	1.0	2	....	....	....	....	....	1.5	....	....
Olney, Archer Co., S.G. Hardaway, A-164 BB&PC RR A-54	1.3	0.3	2	....	....	....	....	....	3.5	....	....
Mills Bennett Estate—Brooks Co., El Tule Grant A-257	8.0	2.0	3	....	....	....	....	1.3	....	....	....
Mitchell Energy & Development Corp.—											
Barton Chapel 1, Jack Co.	15.0	11.4	7	....	....	....	....	....	31.1	....	[11]1.0
Barton Chapel 2, Jack Co.	20.0	15.2	7	....	....	....	....	....	50.5	....	[11]1.3
Brent Ranch, Moore Co.	20.0	9.3	7	....	....	....	....	....	37.2	....	[11]3.7
Bridgeport 1, Wise Co.	150.0	131.0	7	....	124.2	20.7	28.1	....	375.4	61.8	[11]8.8
Bridgeport 2, Wise Co.	20.0	16.4	7	....	15.5	2.6	3.5	....	46.9	7.7	[11]1.1
Bridgeport 3, Wise Co.	20.0	16.4	7	....	15.5	2.6	3.5	....	46.9	7.7	[11]1.1
Bryan Hicks, Brazos Co.	20.0	11.3	7	....	....	....	....	....	55.0	....	....
Canadian River 1, Hutchinson Co.	20.0	6.9	7	....	....	....	....	....	33.6	....	[11]1.4
Canadian River 2, Hutchinson Co.	20.0	6.9	7	....	....	....	....	....	33.6	....	[11]1.4
Cisco, Eastland Co.	15.0	15.6	7	....	....	....	....	....	53.1	....	[11]1.4
Cottonwood, Callahan Co.	15.0	9.3	7	....	....	....	....	....	24.9	....	....
Gibtown, Jack Co.	15.0	11.3	7	....	....	....	....	....	42.9	....	[11]2.1
Huckabay No. 1, Erath Co.	15.0	11.6	7	....	....	....	....	....	40.6	....	[11]0.6
Huckabay No. 2, Erath Co.	15.0	11.6	7	....	....	....	....	....	40.6	....	[11]0.6
Huckabay No. 3, Erath Co.	15.0	11.6	7	....	....	....	....	....	40.6	....	[11]0.6
Live Oak Co.	20.0	13.9	7	....	....	....	....	....	30.1	....	[11]0.9
Lone Camp No. 2, Palo Pinto Co.	10.0	6.9	7	....	....	....	....	....	26.4	....	[11]0.5
Lone Camp No. 3, Palo Pinto Co.	10.0	6.9	7	....	....	....	....	....	26.4	....	[11]0.5

Company, plant, location	MMcfd Gas capacity	MMcfd Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Lone Camp No. 4, Palo Pinto	30.0	20.6	7	....	....	....	....	....	79.3	....	[11]1.5
Mineral Wells, Palo Pinto Co.	15.0	9.9	7	....	....	....	....	....	43.2	....	[11]0.9
Morgan Mill No. 1, Erath Co.	15.0	7.1	7	....	....	....	....	....	20.8	....	[11]0.1
Morgan Mill No. 2, Erath Co.	15.0	7.1	7	....	....	....	....	....	20.8	....	[11]0.1
Morgan Mill No. 3, Erath Co.	20.0	9.5	7	....	....	....	....	....	27.8	....	[11]0.2
Ponder, Denton Co.	2.0	2.3	6	....	....	....	....	....	6.1	....	[11]0.1
Port Arthur, Jefferson Co.	115.0	81.0	7	....	....	....	....	....	103.2	....	....
Ranger No., Eastland Co.	10.0	8.8	7	....	....	....	....	....	30.3	....	[11]1.0
Rockdale, Milam Co.	20.0	5.9	7	....	....	....	....	....	26.0	....	....
Schreiner Ranch, Live Oak Co.	20.0	13.1	7	....	....	....	....	....	37.3	....	[11]0.3
Seven Oaks, Polk Co.	20.0	9.0	2	....	....	....	....	....	21.7	....	....
Springtown, Parker Co.	15.0	11.5	7	....	....	....	....	....	33.0	....	[11]0.2
Wellborn, Brazos Co.	5.0	2.8	3	....	....	....	....	....	9.6	....	....
Winnie, Jefferson Co.	75.0	44.0	7	....	....	....	....	....	43.0	....	....
Worsham Steed, Jack Co.	30.0	1.4	7	....	....	....	....	....	2.2	....	[11]<0.1
Mobil Producing Texas & New Mexico Inc.—											
*Coyanosa, Pecos Co., 48-OW TTRR	140.0	105.0	7	....	....	....	....	16.7	144.6	....	[11]66.9
East White Point, San Patricio Co., G.H. Paul subdiv. of Coleman Fulton Pasture Lands	25.0	11.8	7	....	....	....	....	...	24.4	....	....
Electra, Wilbarger Co., 17-13 H&TC RR	1.2	0.8	3	....	....	....	....	....	12.6	....	....
Hagist, Duval Co., BS&F 267	35.0	13.5	1	....	....	....	....	....	13.0	....	....
LaGloria, Jim Wells Co., 9-3 Rangeland 7 Herring subdiv. LaGloria Townsite subdiv.	320.0	200.0	7	182.0	82.0	26.0	21.0	....	....	54.0	[11]6.1
*Lake Creek, Montgomery Co.	5.5	4.1	7	1.5	2.2	0.6	1.0	....	....	1.4	....
*Pegasus, Midland Co., e2 30-40-4s T&PRR	90.0	84.0	7	77.7	....	....	....	....	165.9	....	....
*Portillo, San Patricio Co., M. S. Welder	15.0	13.8	2	4.0	4.1	1.5	1.8	....	....	5.3	....
Sabine Pass, Jefferson Co., F. C. McReynolds 126 A-432 T&NO RR, 127 A-245, John McGaffey A-167	200.0	85.0	7	....	....	....	....	....	90.9	....	....
Salt Creek, Kent Co., W&NW RR G-193	28.0	12.7	3	....	....	....	....	....	131.7	....	....
Vanderbilt, Jackson Co., R. Musquex A-59	56.7	89.1	2	....	....	....	....	....	....	....	[5]6.4 [9]0.3 §13.3
Waha, Pecos Co., 5-C3 PSL	125.0	54.0	7	....	....	....	....	....	117.6	....	[11]1.7
Wilcox, Lavaca Co., J.R. Ragsdale A-377	235.0	119.0	2	18.4	18.3	....	12.0	....	....	12.0	....
Monsanto Co.—Diamond M, Scurry Co., se¼ 182-97 H&TC	18.0	13.0	6	43.2	58.2	8.0	23.4	....	....	22.6	[11]0.9
Natural Gas Pipeline Co. of America—											
CP 170, Moore Co., w½ of nw¼ section 1 of TTRR	80.0	62.0	7	56.8	66.8	14.2	34.7	....	43.2	....	....
Northern Gas Products Co.—Barnhart, Reagan Co., nw4 3-48 Univ. lands	4.0	NR	3	....	....	....	....	....	....	....	....
DuBose, Gonzales	35.0	7.0	1	....	....	....	....	....	....	....	....
Encinal, Webb Co.	35.0	30.0	7	....	16.0	....	8.9	....	....	5.4	....
Gregory, San Patricio Co., Geranimo Valdez A-269	70.0	30.0	2	....	19.0	....	18.0	....	....	5.0	....
Imperial, Crane Co., 20&21 1 H&TC RR-1	18.0	12.6	7	....	....	....	....	....	41.4	....	....
Lipan, Hood Co., J.R. Anderson A-11	15.0	8.7	7	....	....	....	....	....	29.1	....	....
McMullen Co.	15.0	7.0	3	....	12.0	....	9.0	....	....	4.5	....
Martin Co. No. 1, 31-37-2n TYP RR	10.0	8.6	3	....	....	....	....	....	48.5	....	....
Martin Co. No. 2 4-HA	5.0	3.7	3	....	....	....	....	....	19.4	....	....
Middle Concho, sw4 90-14 H&TC RR Co.	10.0	3.3	6	....	....	....	....	....	17.1	....	....
*Oyster Lake, Matagorda Co.		....	...	....	....	....	....	....	....	....	[11]69.0
Robstown, Nueces Co., Mathis Garcia A-116	80.0	72.0	2	12.0	24.0	....	17.0	....	....	10.0	....
Seven Oaks, Polk Co.	30.0	12.0	5	....	....	....	....	....	....	1.0	....
Shackelford, 14-3 H&TC RR	1.0	0.6	3	....	....	....	....	....	2.2	....	....
Sonora, Sutton Co., HE&WT RR A-352	55.0	50.0	2	....	15.0	....	18.0	....	....	10.0	....
Tuleta, Bee Co., Brooks & Burleson	35.0	7.0	1	....	1.7	....	1.7	....	....	3.5	....
*Victoria Co., James Reed A-236	60.0	35.0	2	....	12.0	....	7.0	....	....	7.0	....
Parade Co.—Giles, Rusk Co.	3.0	1.7	3	....	....	....	....	....	17.2	....	....
Permian Corp.—Possum Kingdom, Stephens Co., E. Romerhausen A-149	5.0	3.5	3	....	....	....	....	....	7.5	....	....
Todd, Crockett, 28-WX GC&SF RR	5.0	2.5	3	....	....	....	....	....	11.0	....	....
Perry Gas Products Inc.—Perry-LaGrange, Fayette Co., Wm. Rabb 3 League A-86	100.0	47.0	7	....	....	....	....	....	206.8	18.3	....
Phillips, Jack L.—Nan Su Gail, Freestone Co.	7.0	1.0	3	....	....	....	....	....	1.3	....	....
Phillips Petroleum Co.—Andrews Co., w2 nw4 19-A 46 PSL	115.0	NR	1-2&6	....	....	....	....	....	....	....	....
Birthright, Hopkins Co., Linecum A-561 and Hargrave A-426	30.0	NR	3	....	....	....	....	....	....	....	....
Brazoria Co., nw4,5 HT&B A-221	55.0	NR	2&7	....	....	....	....	....	....	....	....
Crane Co., ne4 216-F CCSD&RGNG RR	20.0	NR	7	....	....	....	....	....	....	....	....
Dumas, Moore Co., nw4-181-44 H&TC	120.0	NR	7	....	....	....	....	....	....	....	....
East Chapa, Live Oak Co., Chapa A-697	50.0	NR	7	....	....	....	....	....	....	....	....
Fullerton, Andrews Co., Center S-17 A-32 PSL	55.0	NR	7	....	....	....	....	....	....	....	....
Giddings, Fayette Co., David G. Green A-193	75.0	NR	7	....	....	....	....	....	....	....	....
Goldsmith, Ector Co., nw4-se4-33-44 T&P-1n	82.0	NR	7	....	....	....	....	....	....	....	....
Gray Co., e2-32-2 H&GN	74.0	NR	2	....	....	....	....	....	....	....	....
Luling, Caldwell Co., north corner John Henry A-12	12.0	NR	2&7	....	....	....	....	....	....	....	....
Pantex, Hutchinson Co., 8&9 M. Whitley	20.5	NR	2&7	....	....	....	....	....	....	....	....
Puckett, Pecos Co., n2 26-101 TCRR	250.0	NR	5	....	....	....	....	....	....	....	....
Quarry, Washington Co., Nelson-Whitehead A-108	75.0	NR	7	....	....	....	....	....	....	....	....
Rock Creek, Hutchinson Co., nw4-22-y A&B	180.0	NR	7	....	....	....	....	....	....	....	....
Sherman, Hansford Co., 7&8-1 PSL	340.0	NR	7	....	....	....	....	....	....	....	....
Sneed, Moore Co., w2-nw4 Freeman Brazemore	250.0	NR	1	....	....	....	....	....	....	....	....
Spraberry, Midland Co., se4-25 3s-37 T&P	25.0	NR	7	....	....	....	....	....	....	....	....

Company, plant, location	MMcfd Gas capacity	MMcfd Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Pioneer Gas Products Co.—Fain, Potter Co., G&M 10-181B	80.0	52.7	7	....	....	....	....	....	153.8	....	....
Portal Drilling Co.—McMullen Co.	2.2	NR	3	....	....	....	....	....	7.0	....	....
Pronto Gas Products Inc.—Archer City, Archer Co.	1.0	0.3	3	....	....	....	....	....	1.0	....	....
Elbert, Throckmorton Co.	1.0	0.3	...	....	....	....	....	....	1.2	....	....
Knox City, Knox Co.	2.0	0.1	3	....	....	....	....	....	1.2	....	....
Moran, Shackelford Co.	2.0	1.1	...	....	....	....	....	....	3.0	....	....
Newcastle, Young Co.	0.5	0.3	3	....	....	....	....	....	2.5	....	....
Novice, Coleman Co.	2.0	1.0	3	....	....	....	....	....	....	....	....
Wall, Tom Green Co.	0.1	0.6	3	....	....	....	....	....	3.0	....	....
Seagull Products Co.—Matagorda Co., Lot 29 Moore Pasture subdivision	250.0	150.0	7	....	....	....	....	....	11[illegible].3	....	....
Shell Western E&P Inc.—Big Foot, Frio Co.	0.5	0.1	3	....	0.1	....	0.1	....	....	0.2	....
*Bryans Mill, Cass Co., B.F. Lynn A-651	70.0	45.0	2	....	28.5	....	....	41.0	....	....	....
Diamondback, Duvall Co.	30.0	12.0	7	....	....	....	....	....	25.1	....	....
Eustace, Henderson Co. Vincente Michelli A-485	70.0	27.0	7	....	....	....	....	....	183.3	....	....
Fandango, Zapata Co.	90.0	48.0	...	....	....	....	....	....	....	....	....
Houston Central, Colorado Co., F. Mayhar A-400 K. Winn A-589	285.0	122.0	2	113.2	70.8	16.4	18.2	....	....	61.0	....
NW Ozona, Crockett Co., ne14 46-OP GC&SF RR	10.0	5.0	3	....	....	....	....	11.4	....	3.8	....
Tippett, Crockett Co., 38-31-H&TC RR	55.0	25.1	6	36.8	26.8	....	....	33.5	....	....	....
TXL, Ector Co., 17-45-1s T&P RR	40.0	24.0	2	43.5	41.9	....	20.5	....	....	17.7	....
Wasson, Yoakum Co., nw¼ 827 sw¼ 802-D John H. Gibson	190.0	72.0	2	130.0	173.1	....	....	227.0	....	....	....
Sid Richardson Carbon & Gasoline Co.—Chalk, Cottle Co., nw¼ of C.L. Carter FP 4480	12.0	5.0	3	....	....	....	....	....	9.0	....	[11]0.6
Eskota, Fisher Co., 11 T&PRR-19	12.0	7.8	6	....	....	....	....	....	74.1	....	[11]0.1
Halley, Winkler Co., e2-22-B11-PSL	60.0	36.0	7	....	....	....	....	....	115.1	....	[11]1.0
Keystone, Winkler Co., 5-B2 & 1&2 B3-PSL	120.0	106.7	7	....	....	....	....	....	222.9	....	[11]1.2
Sterling Co., 11 acres 2-31-5s T&P RR	40.0	15.9	7	....	....	....	....	....	66.0	....	....
Southwest Forest Gas Gathering Co.—Rocker B 1, Reagan Co., 17 miles ne Big Lake	16.0	6.0	7	....	....	....	....	....	36.0	....	....
SPG Exploration Corp.—Martha F. Berry, Frio Co., M.C. Patton, 1178 A-542	5.0	3.0	6	....	....	....	....	....	7.3	....	....
Ozona, Crockett Co., nw¼ BMN GC&SF RR	60.0	21.5	2	....	27.1	....	12.3	....	....	7.9	[11]12.0
Sun Exploration & Production Co.—Big Wells, Dimmitt Co., I&GN A-223 82-1	20.0	8.8	2	....	8.0	....	6.0	....	....	3.1	....
Desdemona, Eastland Co.	NR	1.2	3	....	....	....	....	....	8.2	....	....
Jameson, Coke Co., 315-1A N&TCRR	70.0	42.2	6&7	....	51.3	....	54.4	....	....	43.9	[5]216.7
Kurten, Brazos Co., James Simpson A-208	35.0	22.8	2	....	....	....	....	....	39.8	....	....
Snyder, Scurry Co., 16-1 JP Smith	50.0	53.3	7	....	109.2	....	79.6	....	....	93.2	[5]332.8
Sun, Starr Co., 239 AB-225 CCSDR RGN GRR	92.0	87.3	2	....	27.6	....	30.4	....	....	32.8	[5]49.6
Tijerina-Canales, Jim Wells Co., 343 CCSD&R GNG RR A-119	40.0	20.9	2	....	5.7	....	8.0	....	....	4.2	[5]18.4
Tenneco Oil Processing & Marketing–Chesterville, Colorado Co., Thomson A-708	55.0	NR	2	....	....	....	....	....	16.9	....	....
Magnolia City, Nueces Co.	60.0	57.5	7	....	....	....	....	....	74.4	....	....
McAllen Ranch, Hidalgo Co.	22.5	22.0	7	....	....	....	....	....	30.9	....	....
O.W. Ward, Hidalgo Co., Porcion 68, Gregario Comancho A-28	145.0	36.1	2	....	5.4	....	4.0	....	....	4.2	....
Texaco Inc.—Bradford Ranch, Midland Co., 13-39-3s, T&P RR	12.5	12.5	7	....	....	....	....	....	40.6	....	....
Burleson Co., J. P. Coleson A-12	60.0	11.3	7	....	....	....	....	....	32.9	....	[11]2.0
Burnett Ranch, Carson Co., 83-5 I&GN	15.0	5.6	3	....	....	....	....	....	18.0	....	....
East Vealmoor, Howard Co., 20-27-H&TC	50.0	33.2	7	108.8	125.4	14.9	48.3	....	....	49.6	....
El Paso, Carson Co., 88-4-1n I&GN RR	150.0	56.4	1	....	....	....	....	....	25.7	....	....
Encinitas, Brooks Co., nw 14 San Antonio Grant A-214	32.0	4.8	2	....	....	....	....	....	10.8	....	....
Fuller, Scurry Co., ne¼ 652-97 H&TC RR	5.0	3.5	3	....	....	....	....	....	48.0	....	....
George West, Live Oak Co., G.W. West sub D 200&201	23.0	18.0	7	....	....	....	....	....	45.0	....	....
Handy, Grayson Co., se¼ I&GN RRA-1441	12.0	1.3	2	....	....	....	....	....	7.5	....	....
*Headlee Devonian, Ector-Midland Co., ne¼ of nw¼ 29-41-2s T&PRR	190.0	179.3	7	....	....	....	....	....	455.7	....	....
Humble, Harris Co., J. B. Stevenson Fee A-703, B-4	4.0	0.8	6	....	....	....	....	....	3.2	....	....
Mabee, Andrews Co., s¼ 32-40-2n, G&MMB & A	5.0	3.0	6	....	....	....	....	....	11.0	....	....
Masterson, Potter Co. 8-G&M 3	10.0	0.7	3	....	....	....	....	....	3.0	....	....
New Hope, Franklin Co., Isaac Barre A-20	50.0	18.2	1	....	6.6	....	9.5	....	....	6.2	[11]34.3
Normanna, Bee Co., Thomas Duty A-21	6.0	1.8	3	....	....	....	....	....	1.2	....	....
Odem, San Patricio, Juan Hart & Sons A-10 J. F. Welder Tract	23.0	13.1	7	....	....	....	....	....	14.7	....	....
Ozona, Crockett, n½ 3-MN, GC&SF RR	25.0	9.2	7	....	....	....	....	....	15.9	....	....
Pangaea-Bivins, Potter Co., sw4 22-0-18 D&P	10.0	3.5	3	....	....	....	....	....	7.2	....	....
*Schafer, Carson Co., 88-4-1n I&GN RR	55.0	44.0	1&7	....	....	....	....	....	265.5	....	....
South Kermit, Winkler Co., sw¼ 22 B-3, PSL	20.0	14.9	7	....	....	....	....	....	14.7	....	....
Spearman, Ochiltree Co., 23-R-B&B	50.0	32.7	2	....	12.3	....	....	....	11.6	....	....
Streetman, Freestone Co., A-536, Jefferson Richards	8.0	3.7	3	....	....	....	....	....	10.5	....	....
Tijerina, Jim Wells Co., A. Canales 300 A-79	50.0	5.9	2	3.3	2.3	....	1.5	....	....	2.0	....
*Watkins, Hutchinson Co., 13 M31 T&C RR (Throughput and debutanized nat. gas included in Schafer).	20.0	...	1	....	....	....	....	....	....	....	....
Texas Oil & Gas Corp—Booker, Lipscomb Co., w2-sw4 1116-43 H&TC RR	6.0	4.9	3	....	....	....	....	....	5.5	....	....
Coyanosa, Pecos Co., 18-143-T&SL RR	75.0	49.9	7	....	....	....	....	....	117.3	....	[11]0.5
Denton Co., BBB&CRR A-161	30.0	12.5	2	....	....	....	....	....	38.8	....	....

Company, plant, location	MMcfd Gas capacity	Gas throughput	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
East Texas, Marion Co., John H. Kernels A-236	75.0	35.2	7	....	14.1	....	13.5	....	....	9.1	[11]0.6
Grapeland, Houston Co., 2 JDJ Procella League A-69	165.0	128.5	7	....	....	....	....	....	121.9	....	....
La Paloma, Kenedy Co., Santa Rosa de Arriba Pedro de la Garza A-36	20.0	7.1	7	....	....	....	....	....	12.7	....	....
Laredo, Webb Co., Porcion 14 of N.D. Hachar Estate	30.0	15.8	2	....	....	....	....	....	14.2	....	[11]0.2
Longview, Gregg Co., Frost Thorn A-5	100.0	23.0	7	....	....	....	....	....	13.9	....	[5]22.7 [11]0.1
Shackelford, Callahan Co., nw corner 24 sw corner 23 Bayland Orphan Home Land	30.0	14.9	2	....	....	....	....	....	41.4	....	....
Three Rivers, Live Oak Co., J.D. Jamison 168 A-268	25.0	18.6	7	....	....	....	....	....	46.2	....	[11]2.1
Tipperary Corp.—Claytonville, Fisher Co., 211-3 H&TC RR	2.0	4.0	2	....	....	....	....	....	31.0	....	....
Peach Creek, Lavaca Co., A-32	15.0	3.5	7	....	....	....	....	....	12.0	....	....
Pearsall, Frio Co., 1-A-307 Henry Castro	8.0	3.1	2	....	....	....	....	....	12.0	....	....
Union Texas Petroleum Corp.—Sour Lake, Hardin Co., 384 A-784 J.F. Keith	20.0	15.3	7	3.3	11.7	3.8	3.6	....	....	5.1	....
Perkins, Coke Co., 2-H&TC RR	25.0	21.8	7	57.6	51.3	8.3	20.3	....	....	20.0	[11]0.7
Walnut Bend, Grayson Co., E.L. Stickney A-1089	10.0	6.0	7	17.5	15.8	2.2	6.2	....	....	6.2	[11]0.3
United Texas Transmission Co.—Galveston Bay, Chambers Co., J. Armstrong A-2	40.0	16.2	7	....	....	....	....	....	14.3	....	[11]1.0
Unocal—Dollarhide, Andrews Co., 25-A52-PSL	13.0	10.4	6	....	....	....	....	....	47.8	....	....
*Fort Trinidad, Houston, Co., RCS A-23	40.0	7.0	2	....	5.2	....	3.6	....	3.3	....	....
Van, Van Zandt Co., JWS A-891	15.0	6.6	2	....	7.4	....	9.9	....	....	10.3	....
Upham Oil & Gas Co.—Bridgeport, Wise Co., Wm. Hersee	12.0	7.0	2	....	8.5	....	5.5	....	5.5	....	....
Valero Hydrocarbons Co.—Armstrong, DeWitt Co. James A. Moody A-333	400.0	327.1	7	205.1	101.6	26.9	31.1	....	48.5	....	....
Bel Junction, Hidalgo Co., TexMex RR A-211	90.0	73.4	7	61.9	24.6	8.6	7.0	....	15.7	....	....
Fort Stockton, Pecos Co., 3-OW, F.M. Hoffman	7.5	3.1	7	6.0	5.5	0.8	1.8	....	1.5	....	....
Freer, Webb Co. BS 1-4 A-1954	190.0	113.5	2	8.0	25.4	8.2	7.3	....	15.2	....	....
Garden City, Sterling Co., 30-22, A-698 H&TC RR	45.0	43.7	7	68.3	68.4	8.2	22.0	....	15.8	....	....
San Martin, Bexar Co. 4010 F. Farias 15 A-2	150.0	121.9	7	68.1	57.1	14.5	20.0	....	25.4	....	....
Shoup, Nueces Co., AB&M 409 A-555	300.0	260.5	7	162.2	79.0	26.3	22.5	....	43.6	....	....
Sonora, Sutton Co., 122, HE&WTRR A-1117	44.0	26.7	7	35.6	22.5	3.4	6.8	....	6.8	....	....
Warren Petroleum Co.—Breckenridge, Stephens Co., n2 22 LAL	NR	9.9	7	....	....	....	....	....	55.1	....	....
Canadian, Hemphill Co., 216 G&MMB&A-C	NR	9.5	7	....	....	....	....	....	22.0	....	....
Como, Hopkins Co., Nacogdoches Univ. A-703	NR	1.8	2	....	2.1	....	1.6	....	....	0.8	....
Encinal, San Patricio Co., 18 of George H. Paul subdiv of Coleman Fulton Pasture lands	NR	4.1	2	....	....	....	....	....	2.5	....	....
Fannett, Jefferson Co., Marrs McLean Tract in Wm. H. Smith League A-198	NR	14.3	2	....	....	....	....	....	4.1	....	....
Fashing, Atascosa and Karnes Cos., Emma Tar H. et al, tract in James Wilkerson 149 A-882	NR	49.1	2	....	5.9	....	3.9	....	....	6.9	....
Gladewater, Gregg Co., David Ferguson	NR	7.3	7	....	....	....	....	....	106.2	....	....
Gruver, Hansford, sw4 5-WDC Hall	NR	4.9	7	....	....	....	....	....	8.0	....	....
McLean, Wheeler Co., 33-24 H&GN RR	NR	7.2	6	....	....	....	....	....	38.0	....	....
Miami, Roberts Co., se4 36-B1-H&GN RR	NR	4.8	7	....	....	....	....	....	15.5	....	....
Monahans, Ward Co., 4-F	NR	23.9	7	....	....	....	....	....	90.7	....	....
Moores Orchard, Fort Bend Co., German Emigration No. 8	NR	9.0	7	....	....	....	....	....	16.7	....	....
Sand Hills, Crane Co., 21-PSL B-21	NR	106.9	2&7	....	....	....	....	....	435.1	....	....
Shackelford Co., TE&L 522 & 523	NR	8.8	7	....	....	....	....	....	49.8	....	....
Sherman North, Grayson Co., Uriah Burns A-121	NR	8.9	2	....	....	....	....	....	31.0	....	....
Sherman South, Grayson Co., James S. Coffee A-232	NR	2.4	7	....	....	....	....	....	5.0	....	....
Snyder North, Scurry Co., ne4 440 H&TCRR B-97	NR	25.3	7	....	....	....	....	....	157.3	....	....
Spear, Gregg & Rusk Co., Mary Van Winkler	NR	1.7	7	....	....	....	....	....	21.9	....	....
Terry Co., 6-D-14 C&M RR	NR	0.6	3	....	....	....	....	....	1.9	....	....
Tolar, Hood Co., Lewis Boatright A-33	NR	0.8	7	....	....	....	....	....	3.2	....	....
Tonkawa, Hemphill Co., 78-41 H&TC RR	NR	2.0	3	....	....	....	....	....	3.0	....	....
Worsham, Ward Co., 56-34 H&TC RR	NR	7.3	7	....	....	....	....	....	14.3	....	....
WilGas Co.—A&M, Burleson Co., John P. Coles A-12	65.0	32.0	3&7	....	....	....	....	....	146.2	23.1	....
La Grange, Fayette Co., James Green A-189	200.0	129.0	7	....	....	....	....	....	567.8	20.5	....
WW Sub Inc.—*Markley, Jack Co., SPRR A-583	2.0	1.0	3	....	....	....	....	....	3.5	....	....
Total	**19,630.8**	**12,116.4**		**3,084.7**	**3,281.1**	**469.7**	**1,460.7**	**818.7**	**13,358.0**	**2,075.2**	**2,000.5**

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† Fractionation. (Figures in parenthesis do not represent primary production, and are not added in state totals). §Butane-gasoline mix.

UTAH

Company, plant, location	Gas capacity	Gas throughput	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Champlin Petroleum Co.—Pineview, Summit Co., 3-2n-7e	25.0	3.1	3&7	....	6.9	....	....	....	15.2	....	....
Yellow Creek, Summit Co. 16-3n-8e	80.0	54.2	7	....	43.0	....	....	....	34.5	....	....
Chevron USA Inc.—Red Wash, Uintah Co., ne4 21 nw4 22-7s-23e	38.0	7.0	3	....	....	....	....	....	....	2.5	....
El Paso Natural Gas Co.—Aneth, San Juan Co., nw4-6-41s-24e	100.0	16.5	1	....	10.0	....	....	....	70.4	....	....
Gary Refining Cl.—Altonah, Duchesne Co., sw-nw 5-2s-3w	12.5	2.2	3	....	2.4	....	1.8	....	....	1.5	....

Company, plant, location	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Bluebell, Duchesne Co., sw-nw 23-1s-2w	23.0	14.1	2	....	14.5	....	....	....	29.4	....	....
Koch Hydrocarbon Co.—Cedar Rim, Duchesne Co., 21-35-6w	12.0	5.4	3	....	3.1	....	3.5	....	....	5.3	....
Marathon Oil Co.—Tin Cup Mesa, San Juan Co., 25-38s-25e	1.0	1.1	3	....	....	....	....	....	3.7	....	....
Mountain Fuel Resources Inc.—Price, Carbon Co., 8-14s-10e	120.0	88.0	3	....	....	....	....	....	3.8	....	....
Unocal—*Lisbon, San Juan Co., 22-30s-24e	80.0	57.9	3	....	23.2	....	15.7	....	....	18.0	....
Utex Oil Co.—*Altamont, Duchesne Co., 34-1s-4w	40.0	10.0	3	....	8.0	....	7.5	....	....	17.0	....
Total	**531.5**	**259.5**		....	**111.1**	....	**28.5**	....	**157.0**	**44.3**	....
WEST VIRGINIA											
Columbia Gas Transmission Corp.—Cobb, Kanahwa Co., Big Sandy district	35.0	31.8	2	....	....	....	....	....	50.1	....	....
Kenova, Wayne Co., Ceredo district	170.0	115.7	2	....	....	....	....	....	186.7	....	....
Consolidated Gas Transmission Corp.—Hastings, Wetzel Co.	150.0	126.5	3	233.1	136.1	23.8	44.8	....	44.8	....	....
Gulf Energy Processing Corp.—Copley Run, Lewis Co.	40.0	22.4	7	....	....	....	....	27.4	....	....	....
Schultz, Pleasants Co.	10.0	9.0	1	....	....	....	....	26.2	....	....	....
West Union, Doddridge Co.	15.0	10.0	7	....	....	....	....	19.4	....	....	....
Pennzoil Producing Co.—10 small plants	10.0	5.2	4	....	....	....	....	....	....	2.0	....
Total	**430.0**	**320.6**		**233.1**	**136.1**	**23.8**	**44.8**	**73.0**	**281.6**	**2.0**	....
WYOMING											
Amoco Production Co.—Antelope Draw, Laramie Co., 31-16n-64w	1.0	0.3	3	....	....	....	....	....	2.3	....	....
Bairoil-Wertz, Sweetwater Co., 7-26n-90w	3.0	2.5	3	....	3.9	....	....	....	11.6	....	....
Beaver Creek, Fremont Co. 10-33n-96w	65.0	23.1	2	....	12.3	....	11.3	....	....	8.5	....
Beaver Creek Phosphoria, Fremont Co., 10-33n-96w	14.0	9.4	4	....	....	....	....	....	....	....	[11]7.9
Chivington LBP, Laramie, 20-16n-62w	...	...	3	....	....	....	....	....	0.3	....	
Elk Basin, Park Co., 29-48n-99w	17.0	11.8	2	....	17.4	....	16.0	....	....	19.0	....
Ryckman Creek, Uinta Co., e2-13-17n-119w-6pm	18.5	12.0	3	....	....	....	....	....	37.0	....	....
Whitney Canyon, Uinta Co., 17-17n-119w	275.0	199.5	7	....	....	....	....	....	176.2	....	[11]178.7
Arco Oil & Gas Co.—Gillette, Campbell Co., 18-50n-73w	31.0	10.1	3	....	20.8	....	12.8	....	....	9.8	[11]0.7
Riverton Dome, Fremont Co., 36-1s-4e	30.0	11.1	2	....	....	....	....	....	....	3.7	[11]0.5
Champlin Petroleum Co.—*Brady, Sweetwater Co., 11-16n-101w	65.0	57.6	2	....	19.3	....	33.9	....	....	18.5	....
Emigrant Trail, Uinta Co., 1-16n-113w	60.0	51.1	7	....	....	....	....	....	75.2	....	....
Manning, Converse Co., 15-39n-73w	3.0	0.5	3	....	....	....	....	....	1.1	....	....
Patrick Draw, Sweetwater Co., 25-19n-99w	27.0	23.5	2&7	1.1	15.0	3.7	6.3	....	....	7.5	....
Chevron USA Inc.—Carter Creek, Uinta Co., 6-18n-119w	150.0	130.0	3	....	....		....	....	....	130.2	....
Cities Service Oil & Gas Corp.—Red Desert, Sweetwater, Co., 7-19n-96w	40.0	3.7	7	....	....	....	....	....	4.0	....	....
Thundercreek, Campbell Co., 24-43n-69w	10.0	0.1	7	....	....	....	....	....	0.4	....	....
Coastal Oil & Gas Corp.—Patrick Draw, Sweetwater Co., 12-19n-99	10.0	2.5	3	....	1.9	....	1.2	....	....	0.4	....
Colorado Interstate Gas Co.—Rawlins, Carbon Co., sw4-sw4 25-21n-86w	220.0	206.0	2	....	61.0	....	46.6	....	25.0	....	....
Farmland Industries Inc.—Gillette, Campbell Co., 1-49n-74w	7.0	1.7	3	....	3.9	....	....	....	....	....	....
Inexco Oil Co.—Well Draw, Converse Co., ne se9-35n-70w	25.0	6.0	2	....	15.0	....	....	....	14.0	....	....
KN Energy Inc.—Casper, Natrona Co., 10-33n-78w	80.0	43.2	1	....	13.0	....	4.2	....	....	3.1	....
Flat Top, Converse Co., 20-33n-68w	5.0	1.6	1	....	2.4	....	....	2.7	....	....	....
Marathon Oil Co.—Rock River, Carbon Co., 34-19n-78w	0.5	0.2	3	....	....		....	....	0.5	....	....
Mitchell Energy & Development Corp.—Converse Co.	1.5	0.1	4	....	....	....	....	....	0.6	....	[11]<0.1
NGL Production Co.—Moxa Arch, Lincoln Co., 19-19n-112w	30.0	27.3	5		....	....	....	....	3.3	....	....
Northern Gas Products Co.—Painter, Uinta Co. nw4 6-15n-119w	64.4	35.0	3	....	....	....	....	114.6	....	....	....
Northwest Pipeline Corp.—Opal, Lincoln Co., 27-21n-114w	400.0	170.0	2&7	....	96.3	....	58.9	....	29.0	42.3	....
Phillips Petroleum Co.—Douglas, Converse Co., se4-ne4 34-33n-71w	75.0	NR	7	....	....	....	....	....	....	....	....
Ralston Processing Associates Inc.—Oregon Basin, Park Co., nw4 8-52n-100w	6.0	1.9	2	....	1.9	....	2.0	....	....	1.7	....
Propane-plus product brought into Basin plant to be fractionated	NA	NA	2	....	1.4	....	1.5	....	....	2.0	....
Sun Exploration & Production Co.—Grieve, Natrona Co., 22-32n-85w	10.0	11.6	2	....	10.4	....	....	....	6.7	...	....
Unocal—Worland, Washakie Co., 17-48n-92w	15.0	9.9	7	....	13.3	....	4.9	....	6.8	...	....
Western Gas Processors—Amos Draw, Campbell Co., se¼ nw¼ 32-1n-75w	30.0	22.0	3	....	....	....	....	30.0	....	[11]1.5	
Fairview, Richland Co., w2 sw4 sw4 24-25n-58e	5.0	4.0	3	...	8.5	....	....	....	....	8.4	[11]0.3
Hartzog Draw, Campbell Co., nw¼ ne¼ 11-45n-76w, 6th PM	10.0	6.0	3	....	....	....	....	....	26.2	....	[11]2.0
Hilight, Campbell Co., sw4 26-45n-71w	60.0	12.0	3	....	14.5	....	10.2	....	....	8.8	[11]1.2
Mule Creek, Niobrara, se¼ sw¼ 33-38n-63w	4.0	0.2	6	....	....	....	....	....	3.9	....	[11]<0.1
Newcastle, Weston Co., n2-nw4 9-42n-64w	5.0	3.0	3	....	8.8	....	....	....	....	10.4	[11]0.9
Oedekoven, Campbell Co., 45-55n-73w	16.0	12.0	3	....	2.2	....	0.9	....	....	1.4	[11]0.2

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Rozet, Campbell Co., Lot 4 sw¼ 18-50n-69w	0.5	<0.1	3	....	8.7	....	....	13.6	....	....	....
Wexpro Co.—Butcherknife Springs, Uinta Co., 35-15n-113w	12.5	2.4	1	....	....	....	....	....	....	....	^{11}5.7
Total	**1,897.9**	**1,188.9**		**1.1**	**351.9**	**3.7**	**210.7**	**160.9**	**424.1**	**277.2**	**198.1**

ABU DHABI

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Abu Dhabi Gas Liquefaction CL—											
Zakum, Umm Shaif, El Bunduq, Das Island.	450.0	489.8	2-5-6	....	337.3	288.8	....	....	....	184.5	†3,699.0
Abu Dhabi National Oil Co.—											
Adgas, Adma offshore area	530.0	430.0	6&7	....	5.6	....	4.6	....	....	3.2	†42.4
Gasco, Adco onshore area	818.0	440.0	6	....	14.3	....	15.6	....	....	16.2	....
Habshan, Thamama F onshore area	250.0	37.0	5	....	....	....	....	....	....	....	^{11}71.4
Habshan, Thamama C onshore area	450.0	155.0	6&7	....	....	....	....	....	....	....	^{11}237.8
Total	**2,498.0**	**1,551.8**		....	**357.2**	**288.8**	**20.2**	....	....	**203.9**	**309.2**

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† LNG.

ALGERIA

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Sonatrach—Camel plant, Arzew	NR	170.0	4&7	....	....	....	....	218.6	....	....	....
Hassi R'Mel, Laghouat, Module 0	NR	1,578.0	NR	....	....	....	....	....	....	....	^{11}2,309.0
Hassi R'Mel, Laghouat, Module 1	NR	2,085.2	6	....	....	....	....	....	....	....	^{11}3,140.2
Skikda	NR	435.0	4&7	....	....	....	....	414.2	....	....	....
Total	**5,335.2**	**4,268.2**		....	....	....	....	**632.8**	....	....	**5,449.2**

ARGENTINA

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Cogasco SA—*Loma de la Lata, Neuquén	353.3	211.8	7	....	87.2	....	60.8	....	....	76.7	....
Gas del Estado—*Cañadón Alfa, Tierra del Fuego	NR	76.0	1	....	....	....	....	....	....	18.6	....
*Cañadón Piedras, Tierra del Fuego	NR	50.0	1	....	....	....	....	....	....	7.6	....
*Cañadón Seco, San Jorge, Santa Cruz	NR	11.0	2	....	5.0	....	5.8	....	....	5.3	....
*Caimancito Norte, Ledesma, Jujuy	...	...	2	....	5.0	....	10.2	....	....	2.6	....
*Centenario, Neuquén	NR	25.0	2	....	8.4	....	10.2	....	....	10.6	....
*El Medanito, La Pampa	NR	22.0	3	....	....	....	....	....	....	7.9	....
*Fernandez Oro, Río Negro	NR	15.0	5	....	....	....	....	....	....	0.4	....
*General Cerri, Buenos Aires	636.0	600.0	7	545.0	312.1	....	201.8	....	....	82.0	....
*Loma de la Lata, Neuquen	353.0	318.0	7	....	83.2	....	60.3	....	....	58.1	....
Rio Neuquen, Neuquen	NR	100.0	5	....	....	....	....	....	....	36.9	....
Total	**1,715.9**	**1,428.8**		**545.0**	**500.9**	....	**349.1**	....	....	**306.7**	....

AUSTRALIA

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Esso Australia Ltd.—											
Gippsland No. 1, Longford, Victoria	370.0	170.0	2	138.0	164.0	....	89.0	....	....	....	^{11}207.0
Gippsland No. 2, Longford, Victoria	367.0	170.0	7	138.0	164.0	....	89.0	....	....	....	^{11}207.0
Gippsland No. 3, Longford, Victoria	370.0	170.0	7	138.0	164.0	....	89.0	....	....	....	^{12}207.0
Santos Ltd.—Moomba	900.0	670.0	1&5-6-7	....	....	....	....	....	941.0	1,344.0	....
Port Bonython	....	....	3&5	....	482.0	....	220.0	....	....	892.0	^{11}611.0
Total	**2,070.0**	**1,180.0**		**414.0**	**974.0**	....	**487.0**	....	**941.0**	**2,236.0**	**1,232.0**

AUSTRIA

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
OeMV AG—Piberbach, Upper Austria	2.2	0.4	....	....	....	....	....	....	....	....	....
Roseldorf, Lower Austria	3.5	3.5	3	....	....	....	....	....	....	....	....
Total	**5.7**	**3.9**		....	....	....	....	....	....	....	....

BAHRAIN

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Bahrain National Gas Co.—Jebel Ad-Dukhan	**143.0**	**110.0**	2	....	**108.4**	....	**91.5**	....	....	**135.5**	....

BANGLADESH

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Bangladesh Gas Fields CL—Titas, Brahmanbaria (6 plants)	340.0	40	1	....	....	....	....	....	....	1.3	^{3}6.6 ^{11}8.2
Habiganj (2 plants)	120.0	40	1	....	....	....	....	....	....	....	^{11}0.1
Total	**460.0**	**80.0**		....	....	....	....	....	....	**1.3**	**14.9**

BOLIVIA

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Yacimientos Petroleos Fiscales Bolivanos—											
*Colpa plant, Andres Ibanez Province, Santa Cruz	192.0	110.0	1	....	....	....	....	....	10.0	....	....
*Rio Grande plant, Cordillera Province, Santa Cruz	282.0	270.0	1	....	....	....	....	....	22.6	....	....
Total	**474.0**	**380.0**		....	....	....	....	....	**32.6**	....	....

BRAZIL

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Petrobrás—Candeias, Bahia	74.1	70.6	2	....	....	....	....	....	119.2	....	....
Catu, Agua Grande, Bahia	55.8	49.4	2	....	....	....	....	....	103.2	....	....
Guamaré, Rio Grande do Norte	70.6	45.0	2	....	....	....	....	113.0	....	20.8	....
Lagoa Parda, Espirito Santo	5.7	5.3	3	....	....	....	....	5.6	....	2.0	....
Reduc I, Rio de Janeiro	70.6	68.3	2	....	....	....	....	122.6	....	20.9	....
Sergipe	92.6	70.6	2	....	....	....	...	158.5	....	45.9	....
Total	**369.4**	**309.2**		....	....	....	....	**399.7**	**222.4**	**89.6**	....

Company, plant, location	MMcfd Gas capacity	MMcfd Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
BRUNEI											
Brunei Shell Petroleum CL—*Seria	48.0	40.0	1	....	12.5	....	....	....	37.1	....	....
Brunei LNG Sendirian Berhad—Darussalam	950.0	783.0	6	....	....	....	....	....	45.0	225.0	....
Total	**998.0**	**823.0**		....	**12.5**	....	....	....	**82.1**	**225.0**	....

Canada

Alberta

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Alberta Natural Gas CL—*Cochrane, ne¼ 16-26-4 5w5m	1,025.0	980.0	6-7	1,635.0	....	....	....	....	590.0	....	....
Altana Exploration Co.—Caroline, 12-36-34-6-w5m	12.0	11.0	2	....	....	....	....	....	12.5	....	....
Monitor, 10-3-35-4-w4m	10.0	9.0	4	....	....	....	....	....	....	....	....
Niton, 10-16-55-13-w5m	5.0	2.0	3	....	....	....	....	....	0.6	....	....
Saddle Lake, 16-26-57-13-w4m	3.5	2.8	4	....	....	....	....	....	....	....	....
Altex Resources Ltd.—Delburne, LSD 10-8-37-23 w4m	18.0	4.8	3-4	....	....	....	....	....	4.7	0.9	....
Penhold, LSD 10-30-36-27 w4m	6.5	3.4	3-4	....	....	....	....	....	2.7	....	....
Amoco Canada Petroleum CL—											
*Ante Creek-1, nw 18-65-23 w5m	10.0	...	3	....	....	....	....	....	7.2	....	....
Ante Creek-2, LSD 4 13-65-24 w5m	3.0	2.7	3	....	....	....	....	....	1.3	0.2	....
Ante Creek-3, LSD 10 4-66-23 w4m	10.0	5.6	3	....	....	....	....	....	2.1	....	....
Berrymoor, 2-50-6 w5m	13.0	2.9	3	....	....	....	....	....	2.6	0.1	....
Bigoray, 6-28-51-8 w5m	13.0	1.0	3	....	....	....	....	....	....	0.1	....
Bigstone D-3, sw¼ 10-61-22 w5m	49.0	12.0	3	....	....	....	....	....	....	....	....
Bigstone Dunvegan, se 10-61-22 w5m	18.0	15.0	3	....	....	....	....	17.1	....	....	....
Buck Creek, nw 24-48-7 w5m	....	....	†	....	....	....	....	....	(130.3)	(72.4)	....
*D-1, East Crossfield, n¼ 14-28-1 w5m	105.2	70.0	3	....	....	....	....	....	1.2	2.2	....
*Elkton, East Crossfield, ne¼ 14-28-1 w5m	34.9	22.0	3	....	....	....	....	....	6.4	3.1	....
Granada, Pembina, LSD 2 18-52-11 w5m	30.0	5.8	3	....	....	....	....	....	9.3	0.1	....
Hylo, 12-65-15 w4m	3.0	1.2	4	....	....	....	....	....	....	....	....
Josephine, ne¼ 1-83-10 w6m	50.0	1.7	3	....	....	....	....	....	....	0.5	....
Kirby, nw 25-73-5 w4m	53.0	15.7	4	....	....	....	....	....	....	....	....
Lanaway, 13-5-36-4 w5m	50.0	8.7	3	....	....	....	....	....	16.4	....	....
Leismer, 21 77-8 w5m	20.0	20.8	4	....	....	....	....	....	....	....	....
Lobstick 1, sw¼ 17-50-7 w5m	20.0	7.5	3	....	....	....	....	....	12.4	....	....
Lobstick 2, sw¼ 17-50-7 w5m	15.0	2.1	3	....	....	....	....	....	1.2	....	....
Marten Hills, 18-76-25 w4m	142.0	36.5	4	....	....	....	....	....	....	....	....
Mitsui, 30-72-4 w5m	25.0	0.8	3&6	....	....	....	....	....	6.0	....	....
*Nipisi, 4 11-80-8 w5m	25.0	19.6	4	....	....	....	....	....	138.0	....	....
Pembalta 1, ne¼ 25-48 7 w5m	8.0	3.6	3	....	....	....	....	....	19.3	....	....
Pembalta 2, e½ 15-47-7 w5m	16.0	11.3	3	....	....	....	....	....	31.1	....	....
Pembalta 5, sw¼ 2-48-8 w5m	7.0	1.7	3	....	....	....	....	....	8.4	....	....
Pembalta 7, sw¼ 34-47-9 w5m	14.0	6.8	3	....	....	....	....	....	26.1	....	....
Pembalta 8, sw¼ 5-49-9 w5m	11.0	2.8	3	....	....	....	....	....	11.5	....	....
*Ricinus, 11-30-35-8 w5m	115.0	85.0	7	....	....	....	....	....	192.4	....	....
Sedalia, 5-26-30-4 w4m	8.5	2.3	3	....	....	....	....	....	....	0.4	....
South Wapiti, ne 36-67 9 w6m	298.0	83.0	3	....	....	....	....	....	....	15.8	....
St. Albert, 14 36-53-26 w4m	2.0	0.3	3	....	....	....	....	....	1.2	....	....
Three Hills Creek, nw½ 13-35-26 w4m	12.0	2.5	3	....	....	....	....	....	2.8	0.7	....
Waskahigan, ne7-64-23 w5m	16.3	4.8	5	....	....	....	....	....	....	0.6	....
*West Whitecourt, 8-17-60-15 w5m	421.6	160.0	3	....	....	....	....	....	....	56.6	....
Worsley, 7-22-87-7 w6m	10.0	0.7	5	....	....	....	....	....	....	0.6	....
Anderson Exploration Ltd.—Bruce, 10-1-48-15 w4m	3.0	2.0	4	....	....	....	....	....	....	....	....
Buff Coulee, 11-12-47-7 w4m	6.6	5.5	4	....	....	....	....	....	....	....	....
Dunvegan, 15-3-81-4 w6m	240.0	150.0	3&4	....	....	....	....	....	....	....	....
Hines, LSD 6-35-85-3 w6m	5.0	4.0	4-5	....	....	....	....	....	....	....	....
Dixonville, 8-14-85-25 w4m	4.0	3.2	4	....	....	....	....	....	....	....	....
Kitscoty, 10-17-51-3	2.0	1.2	4	....	....	....	....	....	....	....	....
Lloydminster, 7-11-51-1 w4m	2.0	1.5	4	....	....	....	....	....	....	....	....
Mirage, 10-2-79-8 w4m	1.5	1.0	3-4	....	....	....	....	....	....	....	[11]0.4
Woking, 11-30-75-4 w6m	5.0	5.0	3	....	....	....	....	....	0.5	....	
Andex Oil Cl—Highvale, 10-4-51-4 w5m	8.0	7.5	1	....	....	....	....	2.2	....	....	[11]0.1
Bumper Development Corp. Ltd.—Bumper Crystal, LSD 16-36-45 w4m	4.0	1.5	3	....	....	....	....	....	4.0	....	....
Canadian Hunter Exploration Ltd.—Basset Lake, ne¼ 29-104-2 w6m	7.0	3.2	5	....	....	....	....	....	....	....	....
Basset Lake South, ne¼ 29-106-5 w6m	4.0	2.7	3	....	....	....	....	....	....	....	....
Elmworth Deep Cut, se¼ 8-70-11 w6m	275.0	165.0	7	....	....	....	....	250.0	....	....	....
Elmworth Shallow Cut, se¼ 8-70-11 w6m	300.0	165.0	5	....	....	....	....	....	....	....	[11]27.0
Haig River, nw¼ 33-104-5 w6m	5.4	2.6	3	....	....	....	....	....	....	....	....
Karr, nw¼ 10-65-2 w6m	50.0	21.0	3	....	....	....	....	....	35.0	....	....
South Gold Creek, nw¼ 15-66-5 w6m	15.0	1.7	1	....	....	....	....	....	....	....	....
Canadian Occidental Petroleum Ltd.—Eaglesham, 5-13-77-26 w5m	8.0	2.3	3	....	....	....	....	....	....	....	[11]1.7
Keystone, 5 35-46-4 w5m	10.0	4.0	2	2.5	2.5	....	....	....	....	2.5	....
Paddle River, LSD 13, 6-57n-8 w5m	80.0	19.0	7	....	....	....	....	....	56.3	....	[11]7.1
Petrogas Processing, Crossfield, s½ 2-26-29 w4m	210.0	85.0	1-3&4	....	27.4	....	20.2	....	....	....	[11]36.2
Canadian Superior Oil Ltd.—*Harmattan, 27-31-4 w5m	504.0	271.2	2	....	91.7	....	65.6	....	....	181.5	....
Lone Pine Creek South, 27-29-28 w4m	35.0	10.2	3	....	....	....	....	....	....	4.6	....
Canterra Energy Ltd.—											
Boyle, Flat Lake, 6 36-64-20 w4m	2.0	1.0	1	....	....	....	....	....	....	....	....
*Cessford, Special Area 3, LSD 4-6-24-10 w4m	12.0	7.3	5	....	....	....	....	....	....	....	[11]<0.1
*Consort, Special Area 4, LSD 7-34-34-6w4m	5.0	2.5	5	....	....	....	....	....	....	....	[11]0.2
*Entice, 1-24-28-24 w4m	8.2	6.0	5	....	....	....	....	....	....	....	[11]0.3
*Flat Lake, 13-12-66-20 w4m	25.0	9.9	5	....	....	....	....	....	....	....	[11]0.2

Company, plant, location	MMcfd Gas capacity	MMcfd Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Ghost Pine, 10-4-32-23 w4m	3.0	2.0	3						0.8		^{11}0.6
Hussar, 13-36-24-21 w4m	60.0	25.0	2		15.0		14.0				^{11}8.0
*Jarvie, 15-5-62 I w5m	12.0	6.0	5								^{11}0.4
Nordegg River, w½ 10-44-12 w5m	66.7	26.8	1								^{11}11.5
Okotoks, MD 31, Foothills, sw¼ 27-20-29 w4m	34.8	29.5	1								^{11}4.1
*Oyen, 11-17-19 4w4	4.0	1.0	5								^{11}<0.1
Rainbow, 10-10-109-8 w6m	93.0	85.4	1-2&4						586.3		
Ram River, 2-37-10 w5m	630.0	360.0	1								
Verger A, 4-28-22-16 w4m	4.5	2.5	1								
Verger B, 7-26-22-16 w4m	4.0	3.5	3								^{11}<0.1
Veteran, Special Area 4, LSD 15-20-34-8 w4m	5.0	3.0	3								^{11}0.9
Wayne Rosedale, 12-4-28-20 w4m	15.0	8.0	3						1.7		^{11}1.0
Winborne, 16-5-35-26 w4m	4.3	3.5	3								^{11}0.2
Chevron Canada Resources Ltd.—											
Bigoray, 10-7-51-9 w5m	3.0	2.1	3-4					11.1			
*Brazeau, 16-35-48-12 w5m	10.0	10.3	3-4					21.6			
Ferrybank, 14-11-45-27 w4m	5.2	5.1	3-4					3.6		<0.1	
Joffre, 14-36-38-27 w4m	9.0	2.1	3-4					2.5			
*Kaybob South No. 3, 15-59-18 w5m	445.0	370.0	2					298.2		274.5	
Mitsue, 11 30-72-4 w5m	30.0	7.4	2&4		25.5		16.5			8.6	
North Gilby, 1-24-41-3 w5m	23.0	17.4	3&5					14.0		0.1	
Princess, 12-12-20-12 w4m	10.0	4.5	5							0.7	
Sylvan Lake, 1-21-38-2 w5m	31.5	15.7	2		14.1		8.5			6.7	
*West Pembina, 11-[illegible]-49-12 w5m	29.7	21.9	3-4					25.1		53.1	
Cooperative Energy Development Corp.—											
Blackie, 06-15-20-27 w4m	4.0	1.2	3-4						1.0		
Carrot Creek, LSD 10-16-53-13 w5m	6.0	3.3	3-4						4.8		
Cessford, LSD 7 5-26-12 w4m	1.0	0.5	3-4							0.1	
Edson 1-13, LSD 1-13-54-19 w5m	10.0	8.6	3-4						9.0		
Edson North, LSD 16-15-53-18 w5m	8.0	3.4	3-4						2.5		
Edson South, 10-30-52-17 w5m	1.5	1.2	3-4					0.3	1.0		
Medicine River, LSD 10-14-39-3 w5m	6.0	2.4	3-4						2.7		
Dome Petroleum Ltd.—Amisk, 4-22-41-8-w4m	10.3	3.4	3-4-5							0.1	
Athabasca East, 9-23-66-22 w4m	9.0	3.2	4								
Athabaska North, 5-18-67-22 w4m	6.0	2.2	4								
Atlee-Buffalo, 12-21-20-8 w4m	4.0	1.0	4								
Arrowwood North, 4-15-21-25 w4m	7.9	4.0	4								
Arrowwood South, Hussar, 1-7-20-25 w4m	24.9	5.2	4								
Bolloque, 16-23-64-26 w4m	10.0	2.7	4								
Bouvier, 15-29-70-24 w4m	5.2	0.7	4								
Braeburn, 16-19-77-10 w6m	5.6	0.1	4								
Brazeau River, 1-46-14 w5m	218.0	79.0	1-3-4					33.3			
Brownfield, se¼-2-39-12 w4m	19.9	14.6	4-5							1.6	
Caroline North, 1-11-35-6 w5m	52.2	27.5	3-4						30.2	25.1	
Caroline South, 3-20-34-4 w5m	53.6	29.7	3&5		18.1		17.6			27.8	
*Castor East, 4-3-38-13 w4m	19.9	7.3	4-5							0.7	
Cessford, 2-8-24-12 w4m	125.0	26.6	3-4							3.1	
Cherhill, 4-24-56-5 w5m	4.5	2.8	3						1.9		
Chinchaga, 1-24-96-5 w6m	89.0	46.2	3-4						46.8	73.0	
Choice, 13-17-40-9 w4m	9.9	1.7	4-5							0.1	
Craigend, 16-1-64-13 w4m	5.0	1.5	4								
Consort, 8-19-36-5 w4m	70.6	21.6	4							8.0	
Cutbank, 7-16-62-8 w6m	70.0	15.8	3-4						6.6		
Duvernay, 11-11-55-12 w4m	14.6	2.0	4								
Edmonton Ethane, sw¼-4-52-25 w4m	315.0	207.1	7	344.8					283.3		
Edwand, 7-12-62-17 w4m	2.5	0.5	4								
Edson, 3&4 11-53-18 w5m	372.0	124.7	1-3-4							38.0	
Elk River, 4-6-47-12 w5m	7.0	1.8	3							0.6	
Empress Ethane 1, sw¼ 12-20-1 w4m	1,500.0	1,304.0	7	716.8					541.1		
Empress Ethane 2, sw¼ 12-20-1 w4m	2,000.0	592.0	7	451.9					292.7		
Enchant, 11-9-14-16 w4m	7.0	4.0	4								
Flat Lake, 11-17-67-18 w4m	6.5	0.6	4								
Garrington, 11-17-34-3 w5m	19.9	7.9	3-4 5&7					22.1	2.5		
Gilby North, 9-12-41-4 w5m	4.6	1.6	3-4							0.7	
Gilby South, 8-26-40-3 w5m	9.0	3.3	5							1.6	
Goodfare, sw 19-72-11 w6m	69.5	43.4	3						12.7		
Haight Mundare, 6-8-53-16 w4m	7.0	2.6	4								
Hilda, 16-22-17-2 w4m	6.0	2.0	4								
Hollow, 10-22-61-20 w4m	10.0	2.3	4								
Hotchkiss MD, 11-29-94-25 w5m	191.1	9.6	4								
Hotchkiss North, 2-35-94-2 w6m	20.6	8.9	4								
Hotchkiss South, 9-34-93-01 w6m	22.1	5.0	4								
Inland, 4-25-51-15 w4m	7.4	1.6	3-4							<0.1	
Inland South, 15-31-50-14 w4m	9.0	3.9	4								
Jenner, 10-34-19-9 w4m	13.9	4.9	4								
Jenner-Musketeer, 10-34-19-09 w4m	13.9	3.7	4								
*Kaybob South 1, 1-12-62-20 w5m	226.0	122.4	1-3-4		77.7		59.7			120.6	
*Kaybob South 2, 3&4 12-62-20 w5m	170.0	108.7	1-3-4						125.8	143.6	
Keystone, 6-15-48-3 w5m	7.4	3.9	3-4						5.3		
Kirby Lake, 12-8-74-5 w5m	44.8	13.5	4								
Lavoy, 11-12-52-14 w4m	15.9	13.2	4								
Lone Pine Creek, 6-23-30-28 w4m	74.0	22.4	3-4							19.6	
Mannville, 3-27-50-9 w4m	33.9	6.5	4								
Medicine Hat, 2-27-15-4 w4m	12.0	10.4	4								
Medicine Hat North, 1-7-16-2 w4m	4.5	3.0	1&4								
Medicine River, 6-16-38-4 w5m	8.0	3.7	3						2.9		
Meanook, 6-10-63-22 w4m	5.2	4.0	4								
Monitor, 2-3-35-5 w4m	6.5	0.8	1&4								
Patricia, 13-5-21-12 w4m	7.9	3.1	4								
Prosperity, 11-28-67-19 w4m	6.0	4.5	1&4								
Provost, ne¼-19-36-5 w4m	80.0	50.0	5							3.3	
Provost East, 3-30-37-2 w4m	9.5	5.2	4-5							0.7	

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Ranfurly, 14-32-50 12 w4m	15.9	3.4	4	....	....	....	....	....	....	....	....
Steele, 10-19-77-24 w4m	9.0	2.2	5	....	....	....	....	....	....	....	....
Sturgeon Lake South, se 2-69-22 w5m	20.0	13.0	3-4	....	....	....	....	....	26.1	....	....
Sundance, 6-25-54-21 w5m	15.5	14.9	3-4	....	....	....	....	....	....	10.5	....
Sylvan Lake, 10-12-38-3 w5m	4.0	1.9	4	....	....	....	....	....	1.6	....	....
Sylvan Lake, 14-32-37-3 w5m	64.7	24.5	3	....	19.9	....	10.3	....	....	9.3	....
Tangent, 16-20-80-24 w5m	7.5	1.1	3	....	....	....	....	....	....	....	....
Tower North, 6-14-76-16 w4m	7.0	7.3	4	....	....	....	....	....	....	....	....
Travers, 16-13-14-18 w4m	15.0	6.7	3-4	....	....	....	....	....	....	0.1	....
Twining, sw 31-32-24 w4m	8.3	6.0	3-4	....	....	....	....	....	....	5.0	....
Valhalla, 1-29-75-9 w6m	31.4	14.5	3	....	....	....	....	....	....	2.1	....
Verger, 6-25-23-16 w4m	2.0	0.1	3	....	....	....	....	....	....	....	....
Vulcan, se¼-24-15-22 w4m	55.2	39.6	3-4	....	....	....	....	....	7.0	....	....
Wandering River, 9-30-72-14 w4m	11.9	1.9	4	....	....	....	....	....	....	....	....
Warwick, 10-18-53-14 w4m	8.4	2.6	4	....	....	....	....	....	....	....	....
West Fox Creek, 13-22-60-19 w5m	15.7	4.5	3-4	....	....	....	....	....	....	....	....
West Paddle River, 11-10-56-11 w5m	17.7	7.8	3	....	....	....	....	6.2	....	1.4	....
Whitelaw, 13-20-81-1 w6m	10.0	2.1	4	....	....	....	....	....	....	....	....
Wildunn, 7-9-12 w4m	10.0	4.6	3	....	....	....	....	....	....	0.3	....
*Willesden Green, 27-42-8 w5m	40.0	27.0	3-7	....	....	....	....	....	30.4	....	....
Zama, nw 12-116-6 w6m	25.2	9.7	3	....	....	....	....	....	13.4	4.7	....
Esso Resources Canada Ltd.—Boundary Lake South, Floral, 1-14-85-13 w6m	17.0	3.1	4	....	....	....	....	....	....	0.8	....
Comet Galaxy, Rainbow Lake, 12-23-110-7 w6m	8.0	5.8	3	....	....	....	....	....	....	....	....
*Devon—1 and 2, 34-50-26 w4m	....	....	†	....	(138.7)	....	(89.8)	....	....	(69.4)	....
Euerdell, Ferrier 14-20-38-7 w5m	10.0	3.8	3-4	....	3.5	....	2.2	....	....	1.1	....
Golden Spike, 16-22-51-27 w4m	126.0	126.0	4	....	20.3	....	13.6	....	....	10.1	....
Joffre D2, Lacombe, ne¼ 17-39-26 w4m	7.5	3.0	3-4	....	2.8	....	1.7	....	....	0.5	....
Judy Creek, 10-25-64-11 w5m	265.0	153.6	1-2-3 4-5&7	....	....	....	....	....	723.4	....	....
Leduc, Devon, 34-50-26 w4m	35.0	29.2	3	....	17.2	....	18.2	....	....	9.1	....
Niton, LSD 14-18-54-12 w5m	50.0	30.7	3	....	3.8	....	3.8	....	....	5.1	....
Quirk Creek, s½ 4-21-4 w5m	90.0	33.3	2	....	14.4	....	10.7	....	....	13.8	....
Redwater, LSD 8 29-57-21 w4m	22.1	10.2	2	....	23.0	....	18.1	....	....	11.1	....
General American Oils Ltd.—*Sylvan Lake, LSD 13-25-37-3 w5m	32.0	20.0	3	....			....	....	26.0	....	....
Goliad Resources Ltd.—Bantry, LSD 4 33-17-12 w4m	5.0	4.0	3	....			....	....	2.5	....	....
Gulf Canada Corp.—											
Baptiste, LSD 5-28-67-22 w4m	10.5	5.1	4	....	....	....	....	....	....	....	....
Blood Magrath, 7-8-6-22 w4m	11.5	3.2	3	....	....	....	....	0.3	....	....	....
Buffalo Lake North, LSD 11-24-41-21 w4m	7.0	1.7	3-4	....	....	....	....	....	....	....	[11]0.1
Hanna, LSD 2-36-31-14 w4m	3.0	1.4	3	....	....	....	....	....	....	....	[11]0.1
Hanlan-Robb, ne¼ 2-49-20 w5m	305.0	144.0	3	....	....	....	....	3.8	....	....	....
Morrin-Ghost Pine, LSD 1, 8-11-31-21 w4m	110.0	47.5	3	....	....	....	....	27.0	....	....	....
Nevis, ne¼ 9-33-38-22 w4m	125.0	68.0	2	....	104.0	60.7	....	....	....	45.1	....
North Sibbald, LSD 6-9-31-1 w4m	2.6	1.4	3	....	....	....	....	....	....	....	....
Rimbey, LSD s½ 5-44-1 w5m	423.0	239.0	2	....	268.0	144.4	....	....	....	188.4	....
Strachan, LSD 11-35-37-9 w5m	275.0	142.0	7	....	....	....	....	82.7	....	118.0	....
Swalwell, LSD 6-33-29-24 w5m	4.0	0.8	6	....	....	....	....	0.5	....	....	....
Home Oil CL—Bashaw, 8-10-42-22 w4m	11.9	5.4	5	....	....	....	....	....	....	....	[11]98.0
Carstairs-Crossfield, 3-3-30-2 w5m	280.0	88.0	2	....	56.4	....	43.4	....	....	77.6	....
Cossack, 7-17-60-17 w4m	6.0	3.5	4	....	....	....	....	....	....	....	....
Leismer, 6, 7-77-7 w4m	35.0	23.5	4	....	....	....	....	....	....	....	....
Marten Hills South-1, 14-22-74-24 w4m	21.0	10.6	4	....	....	....	....	....	....	....	....
Marten Hills South-2, 14-29-74-25 w4m	8.0	0.1	4	....	....	....	....	....	....	....	....
Retlaw, 12-2-13-19 w4m	10.0	2.6	5	....	....	....	....	....	....	455.0	....
South Elkton, 2-3-31-4 w5m	4.4	0.1	2	....	....	....	....	....	....	815.0	....
Tieiand, 5-14-67-2 w5m	10.0	4.4	4	....	....	....	....	....	....	....	....
ICG Resources Ltd..—											
Acheson, sw¼ 2-53-26 w4m	10.0	8.0	3	....	27.0	....	14.0	....	....	8.6	....
Chard, 16-1-79-5-w4m	5.3	5.3	4	....	....	....	....	....	....	....	....
Cowpor, 11-19-80-4w4m	12.0	7.0	4	....	....	....	....	....	....	....	....
Gilby, 10-10-041-03-w5m	12.0	4.0	5	....	....	....	....	....	1.7	....	....
Hilda, 4-26-17 2 w4m	5.5	2.0	4	....	....	....	....	....	....	....	....
Leafland, 13-16-040-05 w4m	5.5	5.5	6	....	....	....	....	8.0	....	....	....
Many Islands, 4-16-14-1 w4m	28.0	15.0	4	....	....	....	....	....	....	....	....
Medicine Hat South, 16-7-11-4 w4m	6.0	2.5	4	....	....	....	....	....	....	....	....
Tweedie, se½ 19-68-12 w4m	15.0	7.5	4	....	....	....	....	....	....	....	....
Kerr-McGee Corp.—Craigmyle, 13-35-32-17 w4m	6.2	4.3	2	....	....	....	....	....	....	....	....
Elnora, 5-19-35-22 w4m	16.0	7.0	2	....	....	....	....	....	....	....	....
Ferrybank, 3-31-44-27 w4m	8.5	8.5	2	....	....	....	....	....	....	....	....
Huxley, 10 8-35-24 w4m	1.1	0.7	1	....	....	....	....	....	....	....	....
Prevo, 10 2-39-1 w5m	1.0	0.5	1	....	....	....	....	....	....	....	....
Rich, 6 16-22-35-21 w4m	3.0	2.0	2	....	....	....	....	....	....	....	....
Lariat Oil & Gas Ltd.—Three Hills, LSD 11-16-31-23 w4m	5.0	2.0	2	....	....	....	....	....	0.8	....	....
Merland Explorations Ltd.—											
Bantry, 5-8-19-13 w4m	18.0	12.0	4	....	....	....	....	....	....	....	....
Beaverhill Lake, 4-17-52-18 w4m	3.0	2.5	1	....	....	....	....	....	....	....	....
Bellshill Lake, 7-21-42-12 w4m	4.0	3.5	1	....	....	....	....	....	....	....	....
Canard, 9-30-57-8 w4m	12.0	12.0	1	....	....	....	....	....	....	....	....
Conlac, Medicine Hat, 14-14-14-3 w4m	25.0	12.0	4	....	....	....	....	....	....	....	....
Delia, 1-13-32-19 w4m	16.0	15.0	4	....	....	....	....	....	....	....	....
Dinant, Bruce, 1-26-45-19 w4m	20.0	20.0	1	....	....	....	....	....	....	....	....
Fenn Big Valley, 8-27-35-19 w4m	8.0	7.0	3-4	....	....	....	....	5.0	....	....	....
Garden-Plains, 5-15-33-13 w4m	10.0	3.5	1&4	....	....	....	....	....	....	....	[11]0.3
Hilda, Medicine Hat, 9-34-18-2 w4m	7.0	3.5	4	....	....	....	....	....	....	....	....
Jarrow, 8-15-45-11 w4m	4.0	3.5	1	....	....	....	....	....	....	....	....
Minburn, 8-24-51-10 w4m	7.0	7.0	1	....	....	....	....	....	....	....	....
North Mannville, 13-16-53-10 w4m	7.0	6.0	1	....	....	....	....	....	....	....	....
North Plain Lake, 13-31-54-11 w4m	14.0	14.0	1	....	....	....	....	....	....	....	....
Sedgewick, 4-27-44-10 w4m	3.0	1.5	1	....	....	....	....	....	....	....	....

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Simonette, 7-6-63-26 w5m	2.0	1.0	4	....	....	....	....	....	....	....	....
Sugden, 11-11-65-9 w4m	2.0	2.0	1	....	....	....	....	....	....	....	....
Vale, Medicine Hat, 15-19-14-3 w4m	30.0	15.0	4	....	....	....	....	....	....	....	....
Viking-Kinsella, 11-17-46-8 w4m	15.0	10.0	1	....	....	....	....	....	....	....	....
Warwick, 8-34-52-14 w4m	4.0	1.5	1	....	....	....	....	....	....	....	....
Westlock, 13-24-61-26 w4m	9.0	6.5	3-4	....	....	....	....	....	....	....	[11]0.1
Willingdon, 11-20-55-15 w4m	18.0	10.0	1	....	....	....	....	....	....	....	....
Mobil-GC Canada Ltd.—Teepee Creek, Grande Prairie, LSD 7-2-74-4 w6m	18.5	6.1	3	....	....	....	....	....	....	1.3	....
Mobil Oil Canada Ltd.—*Carson Creek, 4 23-61-12 w5m	70.0	64.5	2&4	....	79.7	....	52.8	....	....	51.7	....
Duhamel, 3 32-46-21 w4m	3.7	1.4	3-4	....	....	....	....	3.2	1.9	....	....
Pembalta IV, 16 16-49-8 w5m	11.0	6.0	3-4	....	....	....	....	....	5.0	....	....
Three Hills, 4 33-31-23 w4m	30.0	12.0	3-4	....	....	....	....	10.2	....	....	....
Willisden Green, 8 29-40-6-5 w5m	0.9	0.5	3-4	....	....	....	....	....	0.5	....	....
Wimborne, 4 12-34-26 w4m	30.0	11.0	3-4	....	....	....	....	....	....	....	....
Wintering Hills, 16 7-24-16 w4m	6.0	2.5	3-4	....	....	....	....	....	0.1	....	....
Murphy Oil CL—Glendon, Sugden-Grand Rapids, 03-16-61-8 w4m	15.0	9.0	4	....	....	....	....	....	....	....	....
Princess No. 1, 14-23-19-10 w4m	7.5	4.5	4	....	....	....	....	....	....	....	....
Princess No. 2, 08-16-20-10 w4m	7.5	4.5	4	....	....	....	....	....	....	....	....
Norcen Energy Resources Ltd.—Bigoray, Parkland 31, 10-22-51-8 w5m	3.0	0.9	4	....	....	....	....	....	....	0.6	....
Bruce, Beaver 9, 2-6-47-15 w4m	30.0	7.0	1&4	....	....	....	....	....	....	<0.1	....
Ferrier Radial Lake, se¼ 2-34-40-9 w5m	20.5	5.9	2	....	4.6	....	2.2	....	....	2.3	....
Gilby, Lacombe, 10-8-41-1 w5m	3.5	0.4	2&4	....	....	....	....	0.4	....	....	....
Joarcam, 25 Leduc, 7-14-50-22 w4m	2.8	0.6	3-4	....	....	....	....	....	0.3	....	....
Kessler, 14-5-39-8 w4m	6.0	1.7	4	....	....	....	....	0.2	....	....	....
McLeod River, Dist. 14, 7-34-54-14 w5m	5.2	4.1	3	....	....	....	....	3.9	....	....	....
Netook-Olds, Mountain View 17, 16-21-33-1 w5m	2.0	1.1	1&4	....	....	....	....	....	....	0.5	....
Provost-Bodo, Provost 52, ne¼ 16-31-37-2 w4m	6.7	1.6	4	....	....	....	....	....	....	0.1	....
St. Albert, Sturgeon Dist., se¼ 3-26-54-25 w4m	20.0	18.0	2	....	4.7	....	4.4	....	....	2.9	....
NSM Resources Ltd.—Choice, 5 27-40-10 w4m	3.0	2.0	3	....	....	....	....	....	<0.1	....	....
Redwater, Lamont, 15-16-56-20 w4m	1.0	0.1	3	....	....	....	....	....	....	....	....
Redwater, Lamont, 8-25-55-20 w4m	1.0	0.5	3	....	....	....	....	....	....	....	....
Oakwood Petroleums Ltd.—Grand Forks 8-7 LSD 8-7-12-13 w4m	3.0	2.0	1-2-4	....	....	....	....	....	6.8	....	....
Sylvan Lake, Viking A, LSD 10 3-38-2 w5m	2.0	1.0	3-4	....	....	....	....	....	....	....	[11]0.5
Palmer Ranch (1984) Ltd.—Pincher Creek, s½ 23-4-29 w4m	12.0	7.0	3-4	<0.1	....	....	....	....	....	4.5	....
Paloma Petroleum Ltd.—Hotchkiss, LSD 7 13-94-3 w6m	6.0	2.5	1&4	....	....	....	....	....	....	....	....
Vegreville, 6-13-52-14 w4m	8.2	5.0	1&4	....	....	....	....	....	....	....	....
Viking, LSD 12 36-49-13 w4m	4.5	3.9	1&4	....	....	....	....	....	....	....	....
PanCanadian Petroleum Ltd.—Alderson West, 10-28-15-15 w4m	23.5	3.6	3	....	....	....	....	....	....	....	[11]1.3
Alderson West, 6-2-16-15 w4m	6.0	2.8	1	....	....	....	....	....	....	....	....
Bassano Lathom, 10-5-22-18 w4m	25.0	6.3	5	....	....	....	....	....	....	....	[11]0.9
Carseland, 16-21-22-25 w4m	12.0	9.4	3	....	....	....	....	....	....	....	[11]0.2
Countess 10-20-18-15 w4m	6.1	2.8	3	....	....	....	....	5.5	....	....	[11]1.3
Countess Makepeace, 12-33-22-18 w4m	50.0	11.6	3	....	....	....	....	....	....	....	[11]1.6
Entice, 10-7-28-23 w4m	7.0	1.9	3	....	....	....	....	....	....	....	[11]<0.1
Ferrybank, 2-1-44-28 w4m	26.0	8.6	3	....	....	....	....	....	....	....	[11]3.1
Gilby Cantex Nortun, 6-21-40-2 w5m	2.1	0.6	3	....	....	....	....	....	....	....	[11]0.3
Hussar Crowfoot, 14-1-24-22 w4m	28.0	17.9	3	....	....	....	....	5.9	....	....	[11]4.4
Long Coulee, 6-30-15-21 w4m	8.2	2.4	2	....	....	....	....	....	....	....	[11]0.7
Rainier, 16-35-16-16 w4m	2.0	0.3	3	....	....	....	....	....	....	....	....
Redland, 1-20-28-21 w4m	20.0	11.1	3	....	1.2	....	1.7	....	....	....	[11]3.1
Tide Lake, 16-10-18-10 w4m	10.0	6.2	3	....	....	....	....	....	....	....	[11]0.1
Wayne Dalum, 5-17-27-19 w4m	19.0	5.5	5	....	....	....	....	....	....	....	[11]0.9
Wintering Hills, 1-18-25-17 w4m	20.0	3.8	5	....	....	....	....	....	....	....	[11]0.9
Petro-Canada Inc.—Arrowwood, 6-31-20-24 w4m	5.0	2.0	3	....	....	....	....	....	....	0.5	....
Bellshill, 3 28-41-12 w4m	3.0	2.5	3	....	....	....	....	....	5.5	....	....
*Brazeau River, sw¼ 31-48-12 w5m	18.0	13.0	3	....	....	....	....	....	29.7	....	....
*Brazeau River, 4-31-48-12 w5m	25.0	12.8	....	....	....	....	....	19.0	....	....	....
Connorsville, 9 32-25-15 w4m	30.0	13.8	3	....	....	....	....	....	....	2.2	....
Empress, ne¼ 11-20-1 w4m	2,000.0	1,632.2	7	862.6	461.9	....	181.1	....	....	73.9	....
Ferrier, 9 22-39-8 w5m	8.0	5.4	3	....	....	....	....	....	5.9	....	....
Gilby No. 1064, Fina, 7 27-40-3 w5m	4.2	1.8	6	....	....	....	....	....	....	0.3	....
Gilby No. 1130, 2 27-40-3 w5m	25.0	10.0	3	....	....	....	....	....	5.5	....	....
Gilby No. 1156, Medicine River, 5-40-3 w5m	28.0	15.7	3	....	....	....	....	....	14.4	5.4	....
Gold Creek, nw¼ 13 26-67-5 w6m	48.0	11.0	3	....	....	....	....	....	....	25.0	....
Greencourt, se¼ 9 26-59-9 w5m	37.2	15.3	5	....	....	....	....	....	....	2.5	....
*Kaybob, 8 9-64-19 w5m	126.3	46.1	3	....	....	....	....	....	74.9	11.2	....
Rainbow, 15 7-108-6 w6m	14.3	7.8	3	....	....	....	....	....	....	0.3	....
Sedgewick, 2 16-42-12 w4m	6.0	2.3	4	....	....	....	....	....	....	....	....
Whitecourt, Lac St. Anne, 12 26-59-11 w5m	65.0	36.4	5	....	....	....	....	....	....	5.7	....
Wildcat Hills, sw¼ 6 16-26-5 w5m	125.0	58.4	5	....	....	....	....	....	....	11.9	....
Phillips Petroleum Canada Ltd.—*Gilby, LSD 6-36-40-3 w5m	2.7	2.0	6	....	....	....	....	....	....	0.9	....
Placer Cego Petroleum Ltd.—Provost, 4-16-33-07 w4m	5.5	2.2	2	....	....	....	....	....	....	....	[11]0.1
Sedalia, 9-29-31-05 w4m	8.0	6.9	5	....	....	....	....	....	....	....	[11]0.1
Steveville, 2-31-22-11 w4m	22.0	3.0	5	....	....	....	....	....	....	....	[11]0.2
Wood River, 16-08-43 2 w4m	5.0	1.0	5	....	....	....	....	....	....	....	[11]0.2
Saratoga Processing CL—Coleman, 11-8-5 w5m	35.0	20.0	1	....	....	....	....	....	....	....	....
Sceptre Resources Ltd.—											
Cessford, 7-17-26-14 w4m	4.2	1.8	3	....	....	....	....	....	....	....	[11]0.3
Holmberg, nw¼ 13 14-44-17 w4m	11.5	5.5	3	....	....	....	....	....	....	....	[11]0.2

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Huxley, 6-17-34-24 w4m	12.5	3.2	5	....	....	....	....	....	....	....	[11]0.4
Judy Creek, 1-21-63-11 w5m	3.0	0.3	4	....	....	....	....	....	....	....	[11]30.4
Stanmore, 5-1-29-12 w4m	30.0	11.8	3	....	....	....	....	....	....	....	[11]1.3
Shell Canada Resources Ltd.—Burnt Timber 1 and 2, 13-30-7 w5m	114.0	66.7	1-3	....	....	....	....	....	....	7.8	....
Cranberry Lower Debolt, 4-20-96-3 w6m	14.0	8.7	1&4	....	....	....	....	....	....	....	....
Cranberry Slave Point, 4-20-96-3 w6m	17.0	5.8	3-4	....	....	....	....	....	4.0	1.1	....
Gordondale, 24-79-11 w5m	14.6	2.8	1&6	....	....	....	....	....	....	1.7	....
Hope Creek, 17-64-13 w5m	3.2	1.8	1&3	....	....	....	....	....	....	3.2	....
House Mountain, 8-70-10 w5m	4.5	1.1	1&3	....	....	....	....	....	18.3	....	....
Innisfail, 3-35-1 w5m	13.0	4.3	1&3	....	....	....	....	....	....	4.1	....
Jumping Pound, nw¼ 13-25-5-w5m, se¼ 23-25-5 w5m, sw¼ 24-25-5 w5m	200.0	158.0	1-2-7	71.5	41.6	....	35.8	....	....	102.9	....
Pouce Coupe, 8-80-12 w6m	3.0	0.8	1&6	....	....	....	....	....	....	0.4	....
Simonette, 6-63-25 w5m	27.0	5.6	1&3	....	....	....	....	....	7.4	13.8	....
South Rosevear, ne 11-54-15 w5m	50.0	21.1	1&3	....	....	....	....	....	....	6.8	....
Waterton 1-2 and Straddle s½ 20-4-30 w4m, n½ 17-4-30 w4m, se¼ 24-4-1-w5m	315.0	199.0	1-3&7	166.8	87.6	....	76.6	....	....	251.0	....
Star Oil & Gas Ltd.—Opal, Redwater, 8-25-57-23 w4m	6.2	3.0	2&4	....	....	....	....	....	....	....	....
Grassland, 6-13-68-18 w4m	2.0	1.0	4	....	....	....	....	....	....	....	....
Sunnybrook, Bell River Pool 15-22-48-2 w5m	5.0	3.0	3&4	....	....	....	....	....	0.5	....	....
Sylvan Lake, Basal Quartz, Glauc., 16-19-38-1 w5m	8.0	8.0	3&4	....	....	....	....	....	2.0	....	....
Steen Resources Ltd.—Crossfield, 8-20-30-3 w5m	4.0	3.0	4	....	....	....	....	....	....	....	[11]4.2
Sulpetro Ltd.—Castor, 4-3-38-13 w4m	1.5	0.7	6	....	....	....	....	....	3.8	....	....
Minnehik-Buck Lake, 10-5-46-6 w5m	102.0	25.5	5	....	....	....	....	....	....	14.8	....
Wapiti, 4-8-69-8 w6m	125.0	53.2	3	....	....	....	....	....	....	7.1	....
Suncor Inc.—Calling Lake South, 1-20-70-20 w4m	12.0	3.5	1	....	....	....	....	....	....	....	....
Countess-Duchess, Newell Co., LSD 08-36-20-16 w4m	21.0	6.2	4-5	....	....	....	....	0.3	....	....	....
Enchant, Taber Co., LSD 11-35-13-17 w4m	20.0	9.3	4-5	....	....	....	....	0.5	....	....	....
Joffre, LSD 13-12-38-12 w4m	6.4	2.4	3	....	....	....	....	....	2.5	....	....
Killam, Flagstaff 29, LSD 12-23-42-11 w4m	20.0	1.7	4-5	....	....	....	....	<0.1	....	....	....
Northwest Jenner, Imperial Dist., LSD 9-21-21-9 w4m	7.0	0.2	4-5	....	....	....	....	....	....	....	[11]3.8
Rosevear, ne¼ 16-33-54-15 w5m	30.0	12.7	6	....	....	....	....	....	....	....	
Sibbald, LSD 5-6-28-2 w4m	7.5	1.5	4-5	....	....	....	....	0.1	....	....	....
Texaco-Canada Resources Inc.—Battle Lake, 3-23-46-2 w5m	5.5	NR	3	....	....	....	....	....	5.8	....	....
*Bonnie Glen Cycle, 17-47-27 w4m	140.0	NR	7	....	176.6	31.7	69.0	....	....	180.6	....
Bonnie Glen Gas No. 1, 17-47-27 w4m	50.0	NR	2	....	100.7	....	84.0	....	....	54.7	....
Bonnie Glen Gas No. 2, 17-47-27 w4m	50.0	NR	3	280.8	162.2	30.1	65.5	....	....	38.8	....
Cynthia, 13 22-49-10 w5m	8.0	NR	3	....	....	....	....	15.0	....	6.3	....
Gilby, 15-22-40-3 w5m	58.0	NR	3	....	37.0	....	23.0	....	....	27.7	....
Magee, 11-20-42-25 w4m	6.0	NR	3	....	....	....	....	7.0	....	....	....
Open Creek 10-34-42-5 w5m	8.0	NR	3	....	....	....	....	....	13.0	....	....
Wabasca, 16-36-80-25 w4m	6.0	NR	4	....	....	....	....	....	....	....	....
Willesden Green, 17-42-6 w5m	12.2	NR	3	....	....	....	....	17.0	....	6.1	....
Total Petroleum Canada Ltd.—Gilby, 10 12-41-3 w5m	8.0	3.2	1-4-5	....	....	....	....	....	....	....	[11]0.9
Sutton 7 21-90-4 w6m	3.0	1.3	1&4	....	....	....	....	....	....	....	....
Ulster Petroleums Ltd.—Irvine, 1-23-12-2 w4m	4.5	1.5	4	....	....	....	....	....	....	....	....
Westcoast Transmission CL—Ferrier Cardium 2, LSD 1-20-39-7 w5m	23.0	14.0	3	....	....	....	....	....	14.0	....	....
Western Decalta Petroleum Ltd.—Breton, LSD 9-36-47-4 w5m	3.5	1.5	3	....	....	....	....	2.2	....	....	....
Compeer, 6-36-33 2 w4m	5.0	1.8	1	....	....	....	....	....	....	....	....
Diamond Valley, 10-12-19-2 w5m	20.0	19.7	7	44.0	28.6	....	19.1	....	....	13.8	....
Hotchkiss, North, LSD 3 35-94-2 w6m	16.0	7.7	1	....	....	....	....	....	....	....	....
Hotchkiss North 2, 7-31-93 1 w6m	2.5	0.5	1	....	....	....	....	....	....	....	....
Rockyford, 10-24-26-23 w4m	5.0	1.3	3	....	0.2	....	0.3	....	....	0.3	....
Woodbend Oil & Gas Ltd.—Alix, 6-24-40-24 w4m	2.5	0.3	6	....	<0.1	<0.1	<0.1	....	....	0.1	....
Boyer, 11-5-105-24 w5m	6.0	4.0	4	....	....	....	....	....	....	....	....
Total	**20,286.5**	**11,417.6**		**4,576.7**	**2,018.9**	**266.9**	**953.6**	**925.0**	**4,219.5**	**3,822.0**	**259.9**

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†Fractionation. (Figures in parenthesis do not represent primary production, and are not added in state totals).

British Columbia

Dome Petroleum Ltd.—Buick Creek North, 6-31 e-94 A-14	7.1	2.4	4	....	....	....	....	....	....	....	....
Dahl, a-89 H-94 H-7	7.0	1.0	4	....	....	....	....	....	....	....	....
Laprise, a-40 e-94 H-5	31.8	13.5	4	....	....	....	....	....	....	....	....
Velma, a-89 D-94 H-8	12.1	0.3	4	....	....	....	....	....	....	....	....
Esso Resources Canada Ltd.—Boundary Lake, 1-2-85-14 w6	17.5	8.1	2	....	13.7	....	9.0	....	....	3.9	....
Mobil Oil Canada Ltd.—Sierra, c-91d-94I-14	310.0	143.0	5	....	....	....	....	....	....	....	....
Petro-Canada Explorations Inc.—Taylor, 3-25& 26-82-18 w6m Plan 7891, Peace River	397.0	313.5	1&5	....	21.9	....	40.3	....	....	80.3	....
Westcoast Transmission CL—Boundary Lake, A-10-25 15 w6m	8.9	1.0	1	....	....	....	....	....	....	....	....
Fort Nelson, Lot 2683, Peace River	840.0	381.3	1	....	....	....	....	....	....	....	....
Pine River, Lot 1156, Peace River	160.0	35.0	1	....	....	....	....	....	....	....	....
Taylor, 2 36-82-18 w4m Peace River Dist., Plan 7891	375.0	23.0	7	....	12.7	....	5.2	....	....	2.3	....
Total	**2,166.4**	**922.1**		....	**48.3**	....	**54.5**	....	....	**86.5**	....

Company, plant, location	MMcfd Gas capacity	Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Northwest Territories											
Amoco Canada Petroleum Cl—Pointed Mountain, 95-85-n24	188.0	15.6	4	....	....	....	....	....	....	....	....
Esso Resources Canada Ltd.—Norman Wells	8.0	1.1	5	....	....	....	....	....	....	....	....
Total	**196.0**	**16.7**		....	....	....	....	....	....	....	....
Saskatchewan											
Dome Petroleum Ltd.—											
Steelman, w½-21-4-5 w2m	15.0	14.3	7	39.2	....	....	....	....	80.9	....	....
Esso Resources Canada Ltd.—											
Smiley, 8-9-31-25 w3m	3.0	0.4	3	....	....	....	....	....	0.5	....	....
ICG Resources Ltd.—											
Hatton, 4-15-14-27 w3m	9.0	8.0	3-4	....	....	....	....	....	....	....	....
Totnes, 15-33-027-18 w3m	2.5	1.5	4	....	....	....	....	....	....	....	....
Merland Explorations Ltd.—											
Horsham, Hatton, 1-18-16-29 w3m	7.0	5.0	4	....	....	....	....	....	....	....	....
McLaren Lake, Hatton, 14-35-15-29 w3m	1.5	1.4	4	....	....	....	....	....	....	....	....
Sand Hills, Hatton, 4-35-13-25 w3	9.0	7.5	4	....	....	....	....	....	....	....	....
Murphy Oil CL—											
North Dodsland, 8 13-32-21 w3m	3.0	1.6	3	....	....	....	....		....	....	[11]<0.1
Saskatchewan Power Corp.—											
Coleville, nw 17-31-23 w3m	38.4	26.3	2	....	....	....	....	....	....	....	[11]29.3
Hoosier, se 16-30-28 w3m	3.0	0.7	5	....	....	....	....	....	....	....	[11]<0.1
Success, 17-16-17 w3m	50.0	7.1	5	....	....	....	....	....	....	....	[11]<0.1
Star Oil & Gas Ltd.—Hatton 3, LSD 4 16-19-14-26 w3m	8.0	8.0	4	....	....	....	....	....	....	....	....
Hatton East, 16-19-145-26 w3m	9.6	9.6	4	....	....	....	....	....	....	....	....
Total	**159.0**	**91.4**		**39.2**	....	....	....	....	**81.4**	....	**29.3**
CHILE											
Empresa Nacional del Petroleo—*Cullen, Magallanes, XII Región	150.0	120.0	2	....	68.0	....	45.0	....	28.0	....	....
Posesión-*Cabo Negro, Magallanes, XII Región	320.0	310.0	7	....	141.0	....	87.0	....	....	83.0	....
Total	**470.0**	**430.0**		....	**209.0**	....	**132.0**	....	**28.0**	**83.0**	....
CHINA, TAIWAN											
Chinese Petroleum Corp.—Chingtsaohu plant and field, Hsin Chu area	60.0	4.2	7	....	....	....	....	....	3.0	....	....
Chinshui plant, field, and area	36.0	16.7	2	....	7.7	....	5.6	....	....	3.3	....
Chuhuangkeng plant, field, and area	75.0	37.0	1	....	....	....	....	....	....	....	....
Tung Hsiao plant, Tieh-Che-Shan field, Tung Hsiao area	100.0	52.5	7	39.1	24.5	1.5	13.3	....	....	12.3	....
Total	**271.0**	**110.4**		**39.1**	**32.2**	**1.5**	**18.9**	....	**3.0**	**15.6**	....
COLOMBIA											
Empresa Colombiana de Petroleos—CIB, Barranca, Santander	100.0	100.9	7	82.0	31.6	....	....	....	....	....	....
GLP, El Centro, Santander	25.0	20.6	2	....	13.7	....	11.7	....	....	18.9	....
Total	**125.0**	**121.5**		**82.0**	**45.3**	....	**11.7**	....	....	**18.9**	....
DENMARK											
Dansk Naturgas A/S—Nybro, Ribe Amt Jutland	**450.0**	**200.0**	1-3&6	....	....	....	....	....	....	....	**[11]0.9**
DOMINICAN REPUBLIC											
Falconbridge Dominicana C × A—*Bonao field, Arzo-Nouel Province, LaVega, La Peguera	NR	NR	....	....	....	....	....	....	....	....	[6]88.2 [10]189.0
Total	....	....		....	....	....	....	....	....	....	**277.2**
DUBAI											
Arco Oil & Gas Co.—Marghan	**330.0**	**312.0**	6	....	....	....	....	....	....	....	**[11]1,016.4**
ECUADOR											
Ministerio de Recursos Naturales y Energ.—Cepe-Ancon, Santa Elena field, Guayas	NR	NR	1	....	....	....	....	1.9	8.6	....	....
Cepe-Cautivo plant, Santa Elena field, Guayas	NR	NR	1	....	....	....	....	0.5	0.5	....	....
Total	....	....		....	....	....	....	**2.4**	**9.1**	....	....
EGYPT											
Amoco Egypt Oil Co.—Abu Gharadig/Dahshour, Abu Gharadig field, Western Desert, Block 30	125.0	104.0	...	....	....	....	....	15.8	....	....	[11]25.2
Egyptian General Petroleum Corp.—											
Abu Gharadig field, 286 km west of Cairo, Western Desert	148.0	137.0	5-6-7	....	....	....	....	....	....	....	[11]301.1
Abu Madi plant and field, El Mansora, Dakahita	254.0	250.0	6	....	....	....	....	....	....	....	[11]228.4
Abu Qir plant and field offshore, 60 km east of Alexandria	200.0	NR	5-6	....	....	41.6	....	....	....	....	[11]171.7

	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Dahshour, Abu Gharadig field, 65 km west of Cairo, Helwan	137.0	130.0	6-7	....	....	†107.9	....	....	....	....	....
Ras-Shukeir	80.0	69.0	5-6-7	....	....	....	....	109.2	....	....	^{11}63.3
Sinai, Balayim, Abu Rudies	25.0	22.0	3	....	....	39.0	....	....	....	....	^{11}19.0
Total	**969.0**	**872.0**		....	....	**188.5**	....	**125.0**	....	....	**808.7**

†Propane, isobutane, n-butane.

FRANCE											
SNEA—Usine de Lacq	**777.0**	**749.0**	1	....	**163.0**	....	**156.0**	....	....	**347.0**	....
GERMANY											
Norddeutsche Erdgas Aufbereitungs GmbH—											
1—Scholen, Lower Saxony (near Sulingen)	38.0	21.0	1	(sulfur recovery only)							
2—Scholen, Lower Saxony (near Sulingen)	75.0	75.0	1	(sulfur recovery only)							
3—Scholen, Lower Saxony (near Sulingen)	205.0	175.0	1	(sulfur recovery only)							
Wintershall AG—Dueste 1, 2, 3, Staffhorst, Diepholz, Lower Saxony	NR	135.0	Sepasolv	(sulfur only)							
Ruetenbrock, Emsland, Lower Saxony	NR	45.0	Selexol	(sulfur only)							
Total	**542.9**	**451.0**									
GREECE											
North Aegean Petroleum Co.—*Sigma site, Prinos and South Kavala field	**10.5**	**9.5**	1&5	....	....	....	....	....	**85.0**	....	....
HUNGARY											
OKGT:											
Babócsa plant and field, Somogy	4.2	2.9	3	....	....	....	....	....	....	....	^{9}2.2
Berekfürdő, Tatárülés-Kunmadaras, Szolnok	28.3	8.5	6	....	....	....	....	....	....	....	....
Ebes plant and field, Hajdu-Bihar	8.5	3.3	6	....	....	....	....	....	....	....	^{9}0.5
*Eger plant, Demjén field, Heves	5.1	1.7	5	....	....	....	....	....	....	....	^{9}0.2
Endrőd plant and field, Bekes	56.6	28.0	6	....	....	....	....	....	37.6	....	....
Hajduszoboszló plant and field, Hajdu-Bihar	77.7	63.0	2	....	....	....	....	29.0	....	13.0	^{9}2.0
Kardoskút plant, Pusztaföldvár field, Békés	42.4	17.5	3	....	....	....	....	....	16.8	....	....
Kiskunhalas plant and field, Bács-Kiskun	7.1	4.7	6	....	....	....	....	....	....	....	^{9}0.3
Szank plant and field, Bács-Kiskun	77.7	23.4	3	....	....	....	....	....	16.0	....	....
Szeged plant, Algyő field, Csongrád	435.0	240.0	2-3&6	....	97.0	13.5	84.0	62.0	....	95.0	^{1}42.6 ^{9}405.0 ^{9}5.9
Tázlár plant and field, Bács-Kiskun	28.3	7.8	6	....	....	....	....	....	....	....	....
Üllés plant and field, Csongrád	85.0	62.0	6	....	....	....	....	....	145.8	....	....
Total	**855.9**	**462.8**		....	**97.0**	**13.5**	**84.0**	**91.0**	**216.2**	**108.0**	**458.7**
INDONESIA											
Atlantic Richfield Indonesia Inc.—Ardjuna, nw Java Sea, 90 miles ne of Jakarta	180.0	104.0	7	....	400.7	....	....	....	....	175.1	^{11}168.0
Petromer Trend Corp.—Arar, Kepala Burung, Irian Jaya	9.9	9.9	6	....	....	....	....	....	....	....	^{11}5.8
Walio, Kepala Burung, Irian Jaya	2.4	2.4	6	....	....	....	....	....	....	....	^{11}2.1
Petromina—Mundu, Jatibarang, West Java	35.0	23.5	3	....	....	....	....	33.0	16.2	....	....
Rantau, North Sumatra	28.0	17.5	1	....	....	....	....	18.6	....	....	....
Total Indonesie—Handil CPA, East Kalimantan	200.0	160.0	4	....	....	....	....	....	....	....	....
*Handil LEX, East Kalimantan, Psc Mahakam	250.0	160.0	3	....	....	....	....	....	260.0	....	....
*Senipah LEX, East Kalimantan, Psc Mahakam	12.0	9.8	1	....	....	....	....	....	....	....	^{11}52.0
Senipah Tandem, East Kalimantan	22.0	13.3	4	....	....	....	....	....	....	....	....
Unocal—Santan LEX, Attaka, East Kalimantan	145.0	120.0	7	....	126.0	....	....	....	189.0	....	....
Total	**884.3**	**620.4**		....	**526.7**	....	....	**51.6**	**465.2**	**175.1**	**227.9**
ITALY											
AGIP SPA—Brugherio, Po Valley	300.0	282.0	1	....	....	....	....	....	....	....	....
Casalborsetti, Porto Garibaldi field, Bologna, Emilia-Romagna, Po Valley	794.0	455.0	1	....	....	....	....	....	....	0.2	....
Casirate d'Adda, Malossa field, Bergamo, Lombardia, Po Valley	211.0	27.0	2	....	....	....	....	29.6	175.0	....	....
Cortemaggiore, Piacenza, Po Valley	105.0	88.0	1	....	....	....	....	....	....	....	....
Crotone, Luna field, Catanzaro, Calabria	265.0	132.0	1	....	....	....	....	....	....	0.1	....
Falconara, Barbara 'A' field, Ancona	176.0	23.0	1	....	....	....	....	....	....	....	....
*Gagliano, Emma, Sicily	141.0	15.0	5	....	....	....	....	....	....	7.6	....
Grottammare, Emilio-David field, Ascoli Piceno	114.0	40.0	1&2	....	....	....	....	....	....	7.2	....
Hera Lacinia, Crotone, Catanzaro	88.0	25.0	1	....	....	....	....	....	....	....	....
Minerbio, Bologna, Po Valley	1,589.0	1,095.0	1	....	....	....	....	....	....	<0.1	....
Pineto, Fratello-Squalo-Emma field, Roseto, Pescara	176.0	70.0	1	....	....	....	....	....	....	....	....
Ravenna Mare, Porto Corsini Est-Angela fields, Bologna, Emilia Romagna, Po Valley	265.0	169.0	1	....	....	....	....	....	....	0.2	....
Ripalta, Cremona, Po Valley	353.0	318.0	1	....	....	....	....	....	....	....	....
Rubicone, Cervia and Cesenatico fields, Bologna, Emilia-Romagna, Po Valley	176.0	52.0	1	....	....	....	....	....	....	0.1	....
Sergnano, Cremona, Po Valley	1,995.0	1,765.0	1	....	....	....	....	....	....	....	....
Settala, Po Valley	353.0	353.0	1	....	....	....	....	....	....	....	....
Total	**7,101.0**	**4,909.0**		....	....	....	....	**29.6**	**175.0**	**15.4**	....

KUWAIT

Company, plant, location	MMcfd Gas capacity	MMcfd Gas through-put	Process method	Production—1,000 gal/day (Average based on the past 12 months) Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Kuwait Oil Co.—Mina Al-Ahmadi	†	†	‡	....	(95.0)	....	(187.0)	....	....	(145.0)	....
Mina Al-Ahmadi	1,680.0	360.0	2	....	834.0	....	548.0	....	....	305.0	¶85.0
Total	**1,680.0**	**360.0**		....	**834.0**	....	**548.0**	....	....	**305.0**	**85.0**

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†100,000 b/d condensate capacity and 12,800 b/d throughput. ‡Fractionation. (Figures in parenthesis do not represent primary production, and are not included in totals). ¶Unsplit pentanes.

LIBYA

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Oasis Oil Co. of Libya Inc.—*Bahi, Concession 32	15.0	10.0	2&4	....	....	....	....	....	....	....	[11]160.0
*Dahra, Concession 32	140.0	20.0	2&4	....	....	....	....	....	....	....	[11]11.0
Defa, Concession 59 and 71	104.0	47.0	4	....	....	....	....	....	....	....	[11]210.0
Waha, Concession 59W	52.0	52.0	4	....	....	....	....	....	....	....	[11]170.0
Occidental of Libya, Inc.—103A, Sirte Basin Petroleum Zone II	670.0	450.0	3	....	....	....	....	....	666.0	....	....
103D, Sirte Basin, Petroleum Zone II	420.0	255.0	3	....	....	....	....	....	375.0	....	....
Socialist People's Libyan Arab Jamahirya, Marsa Brega	450.0	393.0	NR	....	....	....	....	37.8	4,536.0	....	....
Total	**1,851.0**	**1,227.0**		....	....	....	....	**37.8**	**5,577.0**	....	**551.0**

MALAYSIA

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Petronas—Dew Point Control Unit, Kerteh, Terengganu	250.0	50.0	...	....	10.0	....	12.0	....	....	61.0	....
LPG Unit, Kerth Kemaman, Terengganu	32.0	22.0	2	....	120.0	....	100.0	....	....	103.0	....
Total	**282.0**	**72.0**		....	**130.0**	....	**112.0**	....	....	**164.0**	....

MEXICO

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Petroleos Mexicanos—Cactus, Chiapas (6 plants)	1,600.0	1,317.0	6-7	†1,569.7	‡3,494.0	....	....	....	....	....	....
Ciudad Pemex A, Tabasco	550.0	450.0	2	†247.0	‡551.0	....	....	....	....	....	....
Cuidad Pemex C, Tabasco	200.0	165.0	7	†120.0	‡268.0	....	....	....	....	....	....
La Venta A, Tabasco	200.0	195.0	2	†184.0	‡410.0	....	....	....	....	....	....
La Venta C, Tabasco	215.0	182.0	7	†308.0	‡687.0	....	....	....	....	....	....
Matapionche, Veracruz	30.0	38.0	3	....	....	....	....	....	....	....	[11]14.0
Nuevo Pemex, Tabasco	500.0	191.0	7	288.0	....	....	....	385.4	....	206.1	....
Pajaritos, Coatzacoalcos, Veracruz	192.0	136.0	7	209.5	....	....	....	....	....	....	....
Poza Rica, Veracruz	297.0	275.0	7	457.3	154.4	3.5	81.0	....	....	2.3	....
Reynosa, Tamaulipas	550.0	300.0	2	104.2	92.1	....	72.0	....	....	108.1	....
Total	**4,334.0**	**3,249.0**		**3,487.7**	**5,657.2**	**3.5**	**153.0**	**385.4**	....	**316.5**	**14.0**

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†Estimate. ‡Estimate, C_3+.

NETHERLANDS

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Amoco Netherlands Petroleum Co.—Alkmaar, (Koedijk), Bergen, North Holland	**440.0**	**100.0**	5	....	....	....	....	....	....	....	**[11]4.2**

NEW ZEALAND

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
PetroCorp—Kapuni, Taranaki, Lot 1. Dp 5227, Sec. 11, B-XVI, Kaupokouni SD area 11.2.27	**96.0**	**59.0**	1-3-4	....	**23.6**	....	**3.2**	....	....	**7.9**	....

NORWAY

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Amoco Norway Oil Co.—Valhall A, 56° 16' 41.395" North, 3° 23' 43.193" East	350.0	54.0	7	....	....	....	....	....	222.6	....	....
Statpipe—Kaarstoe, Tysvaer, Rogaland	600.0	62.0	7	....	100.7	7.6	24.9	....	12.6	....	
Total	**950.0**	**116.0**		....	**100.7**	**7.6**	**24.9**	....	**222.6**	**12.6**	....

PAKISTAN

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
Oil and Gas Development Corp.—Sari-Hundi plant and field, Dadu district, Sind province	25.0	8.9	1	....	....	....	....	....	....	....	[11]<0.1
Pakistan Oilfields Ltd.—Meyel field, Attock district, Punjab province	40.0	20.0	1	....	....	....	....	....	....	....	[11]4.7
Meyel field, Attock district, Punjab province	75.0	22.0	7	....	....	....	....	47.0	....	7.6	....
Sui Gas Transmission CL—*Sibbi district, Baluchistan	670.0	630.0	1&5	....	....	....	....	....	....	....	[11]3.1
Sui Northern Gas Pipelines Ltd.—*Sibbi district Baluchistan	140.0	130.0	1	....	....	....	....	....	....	....	....
Total	**950.0**	**810.9**		....	....	....	....	**47.0**	....	**7.6**	**7.8**

Company, plant, location	MMcfd			Production—1,000 gal/day (Average based on the past 12 months)							
	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
PERU											
Petroleos del Peru—Pariñas-Pozo, Piura, Talara	70.0	37.0	2&4	....	....	....	....	....	....	....	....
Verdun, Pariñas, Piura, Talara	....	....	...	....	2.1	....	0.8	7.2	25.4	....	3.2
Total	**70.0**	**37.0**		....	**2.1**	....	**0.8**	**7.2**	**25.4**	....	**3.2**
QATAR											
Qatar General Petroleum Corp.—											
Umm Said No. 1, Dukhan field, onshore	340.0	184.9	3	....	234.9	....	155.8	....	....	120.0	....
Umm Said No. 2, offshore	240.0	129.0	3	....	269.2	....	178.6	....	....	137.5	....
Total	**580.0**	**313.9**		....	**504.1**	....	**334.4**	....	....	**275.5**	....
SAUDI ARABIA											
Arabian American Oil Co.†—Abqaiq	580.0	NR	3-4	....	....	....	....	....	....	....	....
Berri	600.0	NR	1-2-3-4	....	....	....	....	....	....	....	....
Ras Tanura	120.0	NR	3-4	....	....	....	....	....	....	....	....
Shedgum	1,500.0	NR	3-4	....	....	....	....	....	....	....	....
Uthmaniyah	1,500.0	NR	7	....	....	....	....	....	1,176.0	....	....
Total	**4,300.0**	....		....	....	....	....	....	**1,176.0**	....	....

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†Design capacity. Fractionation plants located at Ju'Aymah, Ras Tanura, and Yanbu.

Company, plant, location	Gas capacity	Gas through-put	Process method	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other
SHARJAH											
Amoco Sharjah Oil Co.—Sajaa field	**580.0**	**500.0**	7	....	....	....	....	....	....	....	**[11]2,520.0**
UNITED KINGDOM											
Amoco U.K.—Bacton, Gordon-Forbes-Esmond, 43/8 13, 15	370.0	350.0	3	....	....	....	....	....	....	....	[11]30.0
Bacton, Leman 49/26 27, 28&53/1-2	1,200.0	580.0	3	....	....	....	....	....	....	....	[11]12.6
Bacton, Indefatigable 49/18 19-23&24, Norfolk Co.	600.0	280.0	3	....	....	....	....	....	....	....	[11]21.0
Northwest Hutton, 211/27	43.2	36.0	7	....	....	....	....	....	180.6	....	....
BP Petroleum Development UK Ltd.—Easington and West Sole, Block 48/6, Southern North Sea	300.0	168.0	1-2 4-5	....	....	....	....	....	....	....	[12]11.8
Kinneil, Forties Field	70.0	48.0	4	....	332.0	....	291.0	....	....	176.0	....
Total Oil Marine Ltd.—Saint Fergus, Frigg field, Grampian province	65.0	46.0	3	....	....	....	....	....	....	1,572.5	....
Total	**2,648.2**	**1,508.0**		....	**332.0**	....	**291.0**	....	**180.6**	**1,748.5**	**75.4**
VENEZUELA											
Corpoven											
Bajo Grande fractionation plant, Zulia	....	....	†	....	(93.1)	(33.1)	(39.9)	....	....	(90.0)	....
El Tablazo, Zulia	165.0	137.0	7	....	158.8	78.7	....	....	....	53.4	....
*Lama Liquido, Zulia	150.0	96.0	3	....	80.0	....	62.7	....	....	78.5	....
Lamar Liquido, Zulia	162.0	48.0	3	....	13.3	10.5	....	....	....	11.5	....
Jose, Oriente, Anzoategui	800.0	NR	7	....	105.4	40.2	48.9	18.4	....	37.4	
San Joaquin, Oriente, Anzoategui	800.0	NR	7	....	....	....	....	....	104.4	....	....
Lagoven											
Bachaquero 1, Zulia	440.0	390.0	4	....	....	....	....	....	17.2	....	....
Tia Juana 1, Zulia	230.0	140.0	1	....	....	....	....	....	1.4	....	....
Tia Juana 2, Zulia	450.0	400.0	3	....	....	....	....	....	668.1	....	....
Tia Juana 3, Zulia	455.0	410.0	3	....	....	....	....	....	431.3	....	....
Ule fractionation plant, Punta Gorda Zulia	....	....	†	....	(448.4)	(135.1)	(264.0)	....	....	(499.5)	....
Maraven											
La Paz, Zulia	150.0	84.0	1	....	28.1	7.8	21.1	....	....	22.6	....
Mara, Zulia	55.0	38.0	1	....	8.9	....	....	....	....	9.4	....
Meneven											
Guara Oeste, Anzoategui	42.0	24.0	1	....	....	....	....	19.6	....	15.3	....
Oficina, Anzoategui	9.0	1.0	1	....	....	....	....	0.3	....	2.7	....
Santa Rosa, Anzoategui	150.0	70.0	2	....	....	....	....	222.6	....	8.4	....
RLM, Anaco, Anzoategui	400.0	230.0	3	....	....	....	....	179.9	....	....	....
Total	**4,251.0**	**3,348.0**		....	**394.5**	**137.2**	**132.7**	**440.8**	**1,222.4**	**239.2**	....

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†Parenthetical figures do not represent primary production, and are not added to totals. Bajo Grande plant fractionates LP-gas mix from Corpoven's Lama and El Tablazo plants and Maraven's Lamar and La Paz plants. Ule plant fractionates all raw NGL mix from Lagoven plants.

World sulfur derived from oil, gas production

Ailleen Cantrell
Director of Editorial Surveys

As of Jan. 1, 1986

		Metric tons/day	
Company and location	**Source**	**Design capacity**	**Production**
ABU DHABI			
Abu Dhabi National Oil Co.			
Thamama C Bab	natural gas	800.0	285.0
Ruwais	refinery	86.0	4.0
ARGENTINA			
Duperial			
San Lorenzo	acid gas	44.2	0
Electroclor SAIC			
Capitan Bermudez, Santa Fe	carbon tet	30.0	14.3
AUSTRALIA			
Australian Oil Refining PL			
Kurnell, NSW	refinery	70.0	6.2
Petroleum Refineries Australia PL			
Adelaide	refinery gas	17.9	9.5
Altona	refinery gas	24.6	1.4
Shell Refining (Australia)			
Clyde, NSW	gas treater	75.0	10.0
Geelong, Victoria	gas treater	80.0	15.0
AUSTRIA			
OeMV AG			
Aderklaa	natural gas	32.0	20.0
Schwechat	refinery gas	215.0	66.0
Schwechat	flue gas	34.0	....
BAHRAIN			
Bahrain Petroleum Co. BSC (Closed)			
Sitra	refinery	150.0	98.0
BELGIUM			
Belgian Refining Corp.			
Antwerp	refinery gas	108.5	....
Esso Belgium NV			
Antwerp	refinery gas	350.0	152.0
SIBP			
Antwerp	refinery	225.0	60.0
BRAZIL			
Petrobras			
Recap—Capuava, SP	crude oil	25.0	3.0
Refap—Canoas, RS	crude oil	20.0	12.0
Regap—Betim, MG	crude oil	60.0	19.0
Repar—Araucária, PR	crude oil	65.0	36.0
Replan—Paulínia, SP	crude oil	60.0	17.0
Revap—São Jose Campos, SP	crude oil	170.0	33.0
Petroflex SA			
Duque de Caxias, RJ	refinery acid gas	40.0	30.0
Ultrafertil SA			
Araucária, PR	resid asphalt	57.8	30.0
Cubatão, SP	refinery acid gas	45.0	20.0
CANADA			
Amoco Canada Petroleum CL			
Bigstone, Alberta	natural gas	382.0	123.0
East Crossfield, Alberta	natural gas	1,673.7	1,150.0
West Whitecourt, Alberta	natural gas	1,225.0	1,050.0
Canadian Occidental Petroleum Ltd.			
Paddle River, Alberta	natural gas	25.4	8.3
Canadian Superior Oil Ltd.			
Harmattan, Alberta	natural gas	430.0	110.1
Lone Pine Creek South, Alberta	natural gas	119.0	57.3
Canterra Energy Ltd.			
Nordegg River, Alberta	natural gas	39.0	17.1
Okotoks, Alberta	natural gas	376.0	361.4
Rainbow Lake, Alberta	oil and gas	152.4	76.0
Ram River, Alberta	natural gas	4,580.3	3,000.0
Chevron Canada Ltd.			
Burnaby, B.C.	refinery gas	10.0	1.0
Chevron Canada Resources Ltd.			
Kaybob, South Alberta	natural gas	3,200.0	1,094.0
Dome Petroleum Ltd.			
Caroline, Alberta	natural gas	18.0	6.0
Edson, Alberta	natural gas	297.0	100.0
Kaybob II, Alberta	natural gas	1,097.0	250.0
West Pembina, Alberta	natural gas	300.0	285.0
Esso Resources Canada Ltd.			
Joffre	solution gas	28.9	6.0
Quirk Creek	natural gas	294.0	119.0
Redwater	solution gas	25.0	12.4
Gulf Canada Corp.			
Hanlan-Robb, Alberta	natural gas	1,100.0	529.0
Nevis, Alberta	natural gas	162.7	130.0
Rimbey, Alberta	natural gas	333.0	109.0
Strachan, Alberta	natural gas	1,000.0	470.0
Mobil-GC Canada Ltd.			
Teepee Creek, Alberta	natural gas	30.0	30.0
Mobil Oil Canada Ltd.			
Wimborne, Alberta	solution gas	340.0	130.0
Petro-Canada Inc.			
Brazeau, Alberta	natural gas	78.4	78.4
Gold Creek, Alberta	natural gas	100.0	15.0
Wildcat Hills, Alberta	natural gas	170.0	80.0
Petrogas Processing Ltd.			
Calgary, Alberta	natural gas	1,670.0	800.0
Saratoga Processing CL			
Coleman, Alberta	natural gas	400.0	225.0
Shell Canada Ltd.			
Sarnia, Ontario	refinery gas	35.0	15.0
Scotford, Alberta	refinery gas	10.0	3.0
Vancouver, British Columbia	refinery gas	15.0	5.0
Shell Canada Resources Ltd.			
Burnt Timber, Alberta	natural gas	490.0	396.0
Innisfail, Alberta	natural gas	160.0	15.0
Jumping Pound, Alberta	natural gas	570.0	427.0
Progress, Alberta	natural gas	13.0	....
Rosevear, Alberta	natural gas	160.0	49.0
Simonette, Alberta	natural gas	260.0	75.0
Waterton, Alberta	natural gas	2,900.0	2,452.0
Sulconam Inc.			
Montreal East, Quebec	refinery gas	300.0	132.0
Sulpetro			
Minnehik-Buck Lake, Alberta	natural gas	35.0	22.0
Suncor Inc.			
Ft. McMurray, Alberta	tar sands	730.0	208.0
Rosevear, Alberta	natural gas	....	40.0
Sarnia, Ontario	refinery gas	....	14.0
Syncrude Canada Ltd.			
Mildred Lake, Alberta	tar sands	970.0	830.0
Texaco Canada Resources Ltd.			
Bonnie Glen, Alberta	natural gas	15.0	10.0
Westcoast Transmission CL			
Fort Nelson, British Columbia	natural gas	660.0	260.0
Pine River, Hasler Flats, B.C.	natural gas	1,070.0	223.0
Taylor, British Columbia	natural gas	460.0	174.0
Western Decalta Petroleum Ltd.			
Hartell, Alberta	natural gas	....	10.7
CHINA, TAIWAN			
Chinese Petroleum Corp.			
Kaohsiung	refinery gas	255.0	101.8
Tao-Yuan	refinery gas	155.0	21.3
COLOMBIA			
Empresa Colombiana de Petroleos			
Barrancabermeja	refinery	80.0	27.0
DENMARK			
A/S Dansk Shell			
Fredericia	refinery	25.0	8.0
Kuwait Petroleum Refining (Danmark)			
Gulfhavn	refinery gas	50.0	15.6
EGYPT			
Ameria Petroleum Refining Co.			
Alexandria	refinery gas	....	3.0
General Petroleum Co.			
Eastern Desert	natural gas	....	8.0
Suez Oil Processing Co.			
El-Suez	refinery gas	81.5	9.0
FINLAND			
Neste Oy			
Naantali	refinery gas	43.0	25.0
Porvoo	refinery gas	215.0	120.0
FRANCE			
Compagnie Francaise de Raffinage			
Gonfreville l'Orcher	refinery	190.0	111.0
La Mede	refinery	190.0	87.0
Mardyck	refinery	127.0	23.0
Compagnie Rhenane de Raffinage			
Reichstett	refinery	70.0	22.0
Elf France			
Donges	refinery	210.0	42.8
Feyzin	refinery	118.0	36.5
Grandpuits	refinery	125.0	27.9
Esso SA Francaise			
Fos-sur-Mer	refinery	21.9	18.5
Port Jerome	refinery	21.9	9.1
Mobil Oil Francaise			
Frontignan	refinery gas	72.0	13.0

World petroleum-derived sulfur production — continued

Company and location	Source	Metric tons/day Design capacity	Metric tons/day Production
Shell Francaise			
Berre	refinery	189.0	60.0
Petit-Couronne	refinery	189.0	26.0
Ste. Francaise des Petroles BP			
Lavera	refinery gas	122.0	. . . .
Ste. Francaise Hoechst			
Port Jerome	refinery gas	240.0	. . . .
Ste. Nationale Elf Aquitaine			
Lacq	natural gas	. . . .	3,030.0
GERMANY			
Deutsche BP			
Vohburg	refinery	60.0	27.0
Deutsche Marathon			
Burghausen	refinery gas	41.3	*11.0
Deutsche Shell			
Godorf	refinery	140.0	60.0
Harburg	refinery	78.5	30.0
Deutsche Texaco			
Heide	refinery gas	57.0	21.0
Erdgasaufbereitungsanlage			
Grossenkneten	natural gas	2,100.0	1.527.0
Erdölraffinerie Ingolstadt AG			
Ingolstadt	refinery	32.0	14.0
Erdol-Raffinerie Neustadt GmbH & Co. oHG			
Neustadt-Donau	refinery	86.0	25.0
Esso			
Hamburg	refinery	80.0	14.0
Ingolstadt	refinery	50.0	24.0
Karlsruhe	refinery	100.0	36.0
Mobil Oil AG			
Woerth	refinery	60.0	12.0
Norddeutsche Erdgas-Aufbereitungs			
Sulingen	natural gas	1,050.0	725.0
Oberrheinische Mineralolwerke GmbH			
Karlsruhe	refinery gas	175.0	. . . .
Ruhr Oel GMBH			
Gelsenkirchen	refinery	415.0	. . . .
Union Rheinische Braunkohlen Kraftstoff AG,			
Wesseling	refinery gas	250.0	35.0
Wintershall AG			
Dueste	natural gas	320.0	200.0
Lingen	refinery gas	72.0	60.0
Mannheim	refinery gas	52.0	. . . .
*Annual.			
GREECE			
Hellenic Aspropyrgos Refinery SA			
Aspropyrgos, Attiki	refinery gas	40.0	35.0
Motor Oil Hellas			
Corinth	refinery	90.0	16.0
HUNGARY			
Danube Petroleum Refining Co.			
Szazhalombatta	crude oil	55.0	32.0
Tisza Petroleum Refining Co.			
Leninvaros	crude oil	19.0	19.0
ISRAEL			
Oil Refineries Ltd.			
Ashdod	refinery gas	50.0	30.0
Haifa	refinery gas	50.0	50.0
ITALY			
API-Raffineria di Ancona SpA			
Falconara	refinery gas	40.0	30.0
Esso Italiana			
Augusta	refinery gas	104.0	52.0
Trecate	refinery	40.0	30.0
Industria Italiana Petroli			
Rho	refinery gas	30.0	18.8
Taranto	refinery gas	121.0	51.5
Irom			
Porto Marghera	refinery	20.0	. . . .
Isab			
Melilli	refinery	310.0	. . . .
Mobil Oil Italiana			
Naples	refinery	70.0	13.0
Raffineria del Po			
Sannazzarro	refinery	80.0	. . . .
Saras			
Sarroch	refinery gas	120.0	50.0
Stanic			
Livorno	refinery	21.0	. . . .
Tamoil Italia			
Cremona	refinery	42.0	14.8
IVORY COAST			
Societe Ivoirienne de Raffinage			
Abidjan-Vridi	refinery gas	40.0	. . . .
JAPAN			
Asia Kyoseki Co.			
Sakaide	refinery gas	265.0	140.0
Asia Oil CL			
Yokohama	refinery gas	200.0	100.0
Cosmo Oil CL			
Chiba	refinery gas	600.0	182.0
Sakai	refinery gas	140.0	46.0
Yokkaichi	refinery gas	200.0	76.0
Fuji Oil CL			
Sodegaura, Chiba	refinery gas	240.0	140.0
General Sekiyu KK			
Sakai	refinery gas	374.0	68.2
Idemitsu Kosan CL			
Aichi	refinery gas	400.0	161.0
Chiba	refinery gas	560.0	269.0
Hokkaido	refinery gas	50.0	27.0
Hyogo	refinery gas	230.0	106.0
Tokuyama	refinery gas	235.0	54.0
Kashima Oil CL			
Kashima	refinery gas	420.0	100.0
Koa Oil CL			
Marifu	refinery gas	80.0	34.0
Osaka	refinery gas	60.0	28.0
Kyokuto Petroleum Industries Ltd.			
Chiba	refinery gas	215.0	67.0
Nichimo Sekiyu KK			
Kawasaki	refinery	22.6	. . . .
Nippon Mining CL			
Mizushima	refinery	400.0	227.0
Nagoya, Aichi	refinery	150.0	45.0
Nippon Petroleum Refining CL			
Muroran	refinery gas	420.0	152.0
Negishi	refinery gas	320.0	189.0
Nippon Steel Chemical CL			
Oita	BTX refining	3.0	3.0
Tobata	coke oven gas	2.1	2.1
Seibu Oil Co.			
Yamaguchi	refinery	320.0	. . . .
Showa Oil Co.			
Kawasaki	fuel oil	80.0	. . . .
Showa Yokkaichi Seikyu KK			
Yokkaichi	refinery gas	280.0	. . . .
Toa Nenryo Kogyo KK			
Kawasaki	refinery gas	295.3	79.8
Shimizu	refinery gas	9.8	0
Wakayama	refinery gas	169.3	58.4
Toa Oil Co.			
Kawasaki	refinery gas	330.0	128.4
KOREA			
Ssangyong Refining CL			
Onsan	refinery gas	43.8	19.0
KUWAIT			
Kuwait National Petroleum Co.			
Mina Abdullah	refinery gas	165.0	150.0
Mina Al-Ahmadi	refinery gas	*534.0	200.0
Shuaiba	refinery gas	†1,200.0	300.0
*Two identical units—each 267 t/d.			
†Two identical units—each 600 t/d.			
MEXICO			
Petroleos Mexicanos			
Azcapotzalco, DF	refinery gas	22.6	9.2
Cactus, Chis	natural gas	1,591.2	638.4
Cuidad Madero, Tamps	refinery gas	54.8	20.9
Ciudad Pemex, Tab.	natural gas	651.0	348.3
Matapionche, Ver.	natural gas	27.1	15.3
Nuevo Pemex, Tab.	natural gas	325.5	173.1
Poza Rica, Ver	natural gas	126.6	58.8

World petroleum-derived sulfur production — continued

Company and location	Source	Metric tons/day	
		Design capacity	Production
Salamanca, Gto	refinery gas	153.4	12.9
Salina Cruz, Oax.	refinery gas	71.2	12.3
Totonaca, Tams.	natural gas	27.1	0.1
Tula, Hgo	refinery gas	153.7	10.7
NETHERLANDS			
BP Raffinaderij Nederland NV			
Rotterdam	refinery gas	172.0	43.0
Esso Nederland			
Rotterdam	refinery gas	564.0	285.0
Kuwait Petroleum Europoort BV			
Europoort	refinery gas	50.0	24.2
Shell Nederland Raffinaderij			
Rotterdam	refinery	540.0	150.0
Texaco			
Pernis	refinery gas	90.0	41.0
NETHERLANDS ANTILLES			
Refineria Isla Curazao SA			
Emmastad	refinery	225.0	85.0
NORWAY			
Norske Shell a.s.			
Sola	refinery	20.0	4.0
Rafinor a.s.			
Mongstad	refinery gas	13.0	11.0
OKINAWA			
Okinawa Sekiyu Seisei CL			
Okinawa City	refinery	300.0	180.0
PORTUGAL			
Petrogal			
Lisbon	cat cracking gas	30.0	0
Sines	refinery gas	100.0	23.2
PUERTO RICO			
Yabucoa Sun Oil Co.			
Yabucoa	sour gas	30.0	11.2
QATAR			
Qatar Petrochemical Co.			
Umm Said	acid gas	150.0	100.0
SAUDI ARABIA			
Petromin			
Berri	associated gas	1,200.0	500.0
Shedgum	associated gas	1,700.0	1,000.0
Uthmaniyah	associated gas	1,100	400
SINGAPORE			
Esso Singapore PvL			
Jurong	refinery	126.0	16.3
Mobil Oil Singapore PL			
Jurong	refinery gas	132.0	28.0
Shell Eastern Petroleum			
Pulau Bukom	refinery	220.0	70.0
Singapore Petroleum CPvL*	refinery gas	210.0	37.0
Singapore Refining Co.	refinery	*217.0	65.0
Jurong	. . . .	. . . .	. . . .
*45% share in design capacity.			
SOUTH AFRICA			
Mobil Refining Co. of Southern Africa PL			
Durban	refinery gas	70.0	. . . .
National Petroleum Refiners of South Africa PL			
Sasolburg	refinery gas	90.0	. . . .
Shell & BP South Africa Petroleum Refineries PL			
Durban	refinery gas	106.0	. . . .
SPAIN			
Empetrol			
Cartagena	refinery	27.0	. . . .
La Coruña	refinery	49.0	2.2
Puertollano	refinery	80.0	18.9
Tarragona	refinery	144.0	41.2
Petronor			
Muskiz, Vizcaya	refinery gas	71.4	20.0
Union Explosivos Rio Tinto SA			
La Rábida, Huelva	refinery gas	12.0	5.0
SWEDEN			
BP Raffinaderi Goteburg AB			
Gothenburg	refinery gas	6.0	. . . .
Svenska Shell			
Gothenburg	refinery	27.0	8.0
Skandinaviska Raffinaderi AB			
Lysekil	refinery fuel	225.0	65.0
SWITZERLAND			
Shell Switzerland			
Cressier	refinery	20.0	7.5
TRINIDAD			
Trinidad and Tobago Oil CL			
Pointe-a-Pierre	refinery gas	250.0	35.0
TURKEY			
Tupras			
Izmir	refinery gas	14.2	12.6
Izmit	refinery gas	45.0	12.0
UNITED KINGDOM			
Amoco U.K.			
Milford Haven	refinery	76.0	. . . .
BP Oil			
Grangemouth	refinery gas	100.0	. . . .
Llandarcy	refinery gas	45.0	. . . .
Conoco Ltd.			
South Humberside	refinery gas	50.0	35.0
Esso Petroleum CL			
Fawley	hydrodesulf/ cat plant	270.0	25.0
Gulf Oil Refining Ltd.			
Milford Haven	refinery gas	10.0	4.1
Lindsey Oil & Refining Ltd.			
Killingholm, South Humberside	refinery gas	120.0	60.0
Mobil Oil CL			
Coryton	refinery gas	200.0	25.0
Pembroke Cracking Co.			
Pembroke	refinery gas	160.0	26.9
Shell U.K. Oil			
Shell Haven	refinery gas	30.0	10.0
Stanlow	refinery gas	120.0	50.0
UNITED STATES			
Amoco Oil Co.			
Mandan, North Dakota	refinery	15.0	. . . .
Texas City, Texas	refinery	1,400.0	. . . .
Whiting, Indiana	refinery	400.0	. . . .
Yorktown, Virginia	refinery	56.0	. . . .
Amoco Production Co.			
Andrews County, Texas	natural gas	27.3	15.7
Ector County, Texas	natural gas	30.0	23.3
Eddy County, New Mexico	natural gas	36.0	27.4
Fremont County, Wyoming	natural gas	61.0	25.9
Hockley County, Texas	natural gas	43.0	26.1
Park County, Wyoming	natural gas	76.0	57.6
Van Zandt, Texas	natural gas	313.0	172.3
Uinta County, Wyoming	natural gas	1,205.0	1,139.4
Wood County, Texas	natural gas	30.0	13.7
Arco Petroleum Products Co.			
Carson, Calif.	refinery gas	180.0	. . . .
Cherry Point, Washington	refinery gas	170.0	. . . .
Houston, Texas	refinery gas	350.0	. . . .
Ashland Petroleum Co.			
Canton, Ohio	refinery	99.8	17.7
Catlettsburg, Kentucky	refinery	199.6	59.7
St. Paul Park, Minnesota	refinery	39.9	15.7
BP Oil Corp.			
Belle Chasse, La.	refinery gas	50.0	. . . .
Marcus Hook, Pennsylvania	refinery gas	160.0	. . . .
Cenex			
Laurel, Montana	refinery gas	48.7	20.0
Champlin Petroleum Co.			
Corpus Christi, Texas	crude oil	204.0	110.0
Charter International Oil Co.			
Houston, Texas	refinery gas	181.8	30.0
Chevron U.S.A. Inc.			
Carter Creek, Wyo	natural gas	907.0	

World petroleum-derived sulfur production — continued

Company and location	Source	Metric tons/day	
		Design capacity	Production
Cincinnati, Ohio	refinery gas	10.1	....
El Paso, Texas	refinery gas	42.0	....
El Segundo, California	refinery gas	750.0	....
Pascagoula, Mississippi	refinery gas	1,090.0	....
Philadelphia, Pennsylvania	refinery gas	46.7	....
Port Arthur, Texas	refinery gas	469.3	....
Richmond, California	refinery gas	600.0	....
Salt Lake City, Utah	refinery gas	12.0	....
Citgo Petroleum Corp.			
Lake Charles, Louisiana	refinery gas	330.0	330.0
Coastal Refining & Marketing Inc.			
Corpus Christi, Texas	refinery gas	85.0	44.0
Colorado Interstate Gas Co.			
Table Rock, Wyoming	natural gas	80.0	21.1
Conoco			
Commerce City, Colorado	refinery gas	19.0	16.0
Westlake, Louisiana	refinery gas	290.0	195.0
Crown Central Petroleum Corp.			
Pasadena, Texas	refinery gas	14.3	10.5
Diamond Shamrock Corp.			
Moore County, Texas	natural gas	30.5	17.0
El Paso Hydrocarbons Co.			
Foster, Ector County, Texas	natural gas	20.0	13.0
El Paso Natural Gas Co.			
Eunice, Lea County, New Mexico	natural gas	64.0	22.0
Goldsmith, Ector County, Texas	natural gas	145.0	33.0
Jal 4, Lea County, New Mexico	natural gas	23.0	13.0
McElroy, Crane County, Texas	natural gas	88.0	29.0
San Juan River plant, Texas	natural gas	53.0	16.0
Exxon Co.			
Atascosa County, Texas	natural gas	....	5.9
Baton Rouge, Louisiana	crude	480.0	....
Baytown, Texas	crude	863.0	....
Benicia, California	crude	288.0	....
Crane County, Texas	natural gas	....	18.7
Escambia County, Alabama	natural gas	....	859.3
Linden, New Jersey	crude	290.0	....
Santa Rosa County, Florida	natural gas	....	249.8
Fina Oil & Chemical Co.			
Big Spring, Texas	refinery	50.0	40.0
Port Arthur, Texas	refinery	182.0	90.0
Fletcher Oil & Refining Co.			
Carson, California	refinery gas	10.0	3.0
Frontier Oil & Refining Co.			
Cheyenne, Wyo.	refinery gas	45.7	14.4
Hawaiian Independent Refinery Inc.			
Ewa Beach, Hawaii	refinery gas	14.0	4.6
Hunt Refining Co.			
Tuscaloosa, Alabama	refinery gas	80.0	32.3
Koch Hydrocarbon Co.			
McKenzie County, North Dakota	natural gas	187.0	100.0
Harmony, Mississippi	natural gas	10.0	2.0
Koch Refining Co.			
Corpus Christi, Texas	refinery gas	50.0	7.0
St. Paul, Minnesota	refinery gas	425.0	400.0
LaGloria Oil & Gas Co.			
Tyler, Texas	refinery	9.9	4.8
Louisiana Land & Exploration Co.			
Saraland, Ala.	refinery	54.9	0
Mapco Petroleum Inc.			
Memphis, Tennessee	refinery gas	43.0	14.4
Marathon Oil Co.			
Detroit, Michigan	refinery	80.0	32.1
Eddy County, New Mexico	natural gas	25.4	20.3
Garyville, Louisiana	refinery	480.0	137.0
Pecos County, Texas	natural gas	50.0	45.0
Robinson, Illinois	refinery	40.0	22.3
Mobil Oil Corp.			
Beaumont, Texas	refinery	100.0	63.0
Ferndale, Washington	refinery	19.5	12.0
Joliet, Illinois	refinery	315.0	280.0
Paulsboro, New Jersey	refinery	135.0	71.0
Paulsboro, New Jersey*	refinery	135.0	....
Torrance, California	refinery	200.0	140.0
Torrance, California*	refinery	100.0	....
*Standby units.			
Montana Sulfur & Chemical Co.			
East Billings, Montana	refinery gas	225.0	100.0
Murphy Oil USA Inc.			
Meraux, Louisiana	refinery gas	35.0	12.0
Superior, Wisconsin	refinery gas	14.0	7.0
Newhall Refining Cl			
Newhall, California	refinery	7.5	7.0
Northern Natural Gas Co.			
Hobbs, New Mexico	natural gas	30.5	4.4
Oxy Cities Service NGL Inc.			
Lignite, North Dakota	natural gas	14.0	5.2
Milnesand, New Mexico	natural gas	23.0	8.4
Myrtle Springs, Texas	natural gas	304.0	198.0
Welch, Texas	natural gas	1.5	1.0
West Seminole,Texas	natural gas	10.0	2.6
Pennzoil Products Co.			
Shreveport, La.	refinery gas	11.7	2.5
Phillips Petroleum Co.			
Andrews, Texas	acid gas	18.0	9.0
Borger, Texas	acid gas	142.0	134.0
Buckeye, New Mexico	acid gas	62.0	16.0
Chatom, Alabama	acid gas	193.0	115.0
Fullerton, Texas	acid gas	61.0	49.0
Hopkins County, Texas	natural gas	30.5	8.6
Sweeny, Texas	acid gas	275.0	240.0
Williams County, North Dakota	natural gas	150.0	85.0
Rock Island Refining Corp.			
Indianapolis, Indiana	refinery gas	20.3	3.0
Shell Oil Co.			
Bryans Mill, Texas	natural gas	175.0	....
Clark Avenue, California	natural gas	4.0	....
Deer Park, Texas	refinery	410.0	....
Frederic 10, Michigan	natural gas	20.0	....
Goodwater, Mississippi	natural gas	40.0	....
Manistee County, Michigan	natural gas	25.0	....
Martinez, California	refinery	195.0	....
Norco, Louisiana	refinery	45.0	....
Thomasville, Mississippi	natural gas	1,245.0	....
Wilmington, Calif.	refinery	200.0	....
Wood River, Illinois	refinery	300.0	....
Sid Richardson Carbon & Gasoline Co.			
Winkler County, Texas	natural gas	20.0	8.8
Sinclair Oil Corp.			
Sinclair, Wyoming	crude	25.4	11.4
Smackover-Shell Ltd.			
Henderson County, Texas	natural gas	660.0	....
Standard Oil Co.			
Lima, Ohio	refinery gas	40.0	....
Toledo, Ohio	refinery gas	120.0	....
Tenneco Oil Processing and Marketing			
Chalmette, Louisiana	refinery gas	360.0	84.0
Texaco Inc.			
Anacortes, Washington	refinery gas	51.0	....
Bakersfield, California	refinery gas	19.0	....
Convent, Louisiana	refinery	660.0	....
Delaware City, Delaware	refinery gas	427.0	....
El Dorado, Kansas	refinery gas	178.0	....
Franklin County, Texas	natural gas	223.0	93.0
Freestone County (Aker), Texas	natural gas	180.0	76.0
Freestone County (Teas), Texas	natural gas	140.0	67.0
Port Arthur, Texas	refinery	238.0	....
Wilmington, California	refinery	238.0	....
Texas Oil & Gas Corp.			
Coyanosa, Texas	natural gas	20.0	10.0
Pittsburg, Texas	natural gas	100.0	34.0
Teague, Texas	natural gas	10.0	9.0
Tosco			
Martinez, California	refinery gas	181.5	100.0
Total Petroleum Inc.			
Alma, Michigan	refinery gas	13.0	6.0
Ardmore, Oklahoma	refinery gas	15.0	10.0
Trans-Jeff Chemical Corp.			
Tilden, Texas	sour gas treat	95.0	26.8
Union Oil Co. of California			
Lemont, Illinois	refinery gas	400.0	....
Nederland, Texas	refinery gas	17.0	....
Rodeo, California	refinery gas	350.0	....
Santa Maria, California	refinery gas	69.0	....
Wilmington, California	refinery gas	200.0	....
Valero Refining Co.			
Corpus Christi, Texas	refinery gas	310.0	104.0
Warren Petroleum Co.			
Como, Hopkins County, Tex.	natural gas	85.0	2.0
Fashing, Atascosa County, Tex.	natural gas	36.0	30.0
Little Knife, Billings County, N.D.	natural gas	100.0	125.0
Monument, Lea County, N.M.	natural gas	32.0	15.0
Sand Hills, Crane County, Tex.	natural gas	52.0	45.0
VENEZUELA			
Corpoven			
El Palito, Carabobo	refinery	42.0	29.1
Lagoven			
Amuay, Falcon	refinery	600.0	201.0
Maraven			
Cardon, Falcon	refinery	94.0	58.0

ETHYLENE REPORT

Ethylene producers may be on verge of better times

Installed ethylene capacity: 1986

Company	Location	Capacity, 1,000 metric tons/year	Feedstock†	Coproducts	Capacity, 1,000 metric tons/year§
Allied Corp. (with Borg Warner & BASF-Wyandotte	Geismar, La.	325	E,P	Propylene	21
				Butadiene	16
Amoco Chemicals Corp.	Chocolate Bayou, Tex.	975	E,P,N	Propylene	390
				Butadiene	91
				Aromatics	85
Lyondell Chemical Co.	Channelview, Tex.	1,270	E,P,N,G	Propylene	725
				Butadiene	200
				Py. gas	1,180
				Aromatics	220
				Fuel oils	670
Corpus Christi Petrochemical Company	Corpus Christi Tex.	545	L,H,N,G	Propylene	256
				C_4	185
				Benzene	196
				Py gas	143
Fina Oil & Chem.	Groves, Tex.	9	R	Propylene	30
Dow Chemical	Freeport, Tex.	1,136	E,P,B,N	Propylene	250
				Butadiene	39
	Plaquemine, La.	682	E,P,B,N	Propylene	75
Du Pont Petrochemical	Alvin, Tex.	682	E,P,B N, G	Propylene	545
				Aromatics	522
	Orange, Tex.	375	E, P	Propylene	—
				C_4	—
El Paso Products Co.	Odessa, Tex.	236	E,P	Propylene	65
				Butadiene	4
				Aromatics	15
Exxon Chemical U.S.A.	Baton Rouge, La.	590	E,P N,G	Propylene	400
				Butadiene	—
				Aromatics	—
	Baytown, Tex.	590	N,G	Propylene	408
				Butadiene	113
B.F. Goodrich	Calvert City, Ky.	136	P	Propylene	90
Chevron Chemical Co.	Port Arthur, Tex.	432	LPG	Propylene	165
				Butadiene	22
	Baytown, Tex.	730	R,N,G	Propylene	355
				Butadiene	190
Mobil Chemical Co.	Beaumont, Tex.	455	LPG,N	Propylene	110
				Butadiene	35
				Aromatics	35
Northern Petrochemical	Morris, Ill	430	E,P,B	Propylene	110
				Butadiene	15
				Py gas	25
	Clinton, Iowa	365	E,P	Propylene	14
				Butadiene	17
				Py gas	24
				Fuels	124
Olin Corp.	Brandenberg, Ky.	48	E,LPG		
Phillips Petroleum	Sweeney, Tex.	1,143	NGL	Propylene	170
				Butadiene	44
Shell Chemical	Deer Park, Tex.	800	NGL,R	Propylene	530
				Butadiene	50
				Aromatics	906
	Norco, La.	1,018	NGL,R	Propylene	636
				Butadiene	227
				Py gas	—
Sun-Olin	Claymont, Del.	109	R	—	—
Texaco	Port Arthur, Tex.	450	E,P,N	Propylene	225
	Port Neches, Tex.	170	E,P,R	Propylene	66
				Butadiene	227
Texas Eastman	Longview, Tex.	611	E,P,N	Propylene	284
				Aromatics	101
				Fuel oils	9
Union Carbide	Seadrift, Tex.	562	E,P	Propylene	46
				Butadiene	—
				Aromatics	—
	Taft, La.	500	LPG,N	Propylene	193
				Butadiene	—
				Aromatics	—
	Texas City, Tex.	702	LPG,N	Propylene	136
				Butadiene	—
				Aromatics	—
U.S.I.	Deer Park, Tex.	180	E	—	—
USS CHemicals	Houston, Tex.	227	NGL,R	Propylene	75
Vista Chemical Co.	West Lake, La.	295	E	Propylene	8
				Butadiene	15
				Aromatics	8
U.S. Total		16,778			

Installed ethylene capacity: 1986* (continued)

Company	Location	Capacity, 1,000 metric tons/year	Feedstock†	Coproducts	Capacity, 1,000 metric tons/year§
ALGERIA					
Sonatrach	Arzew	364	LNG	—	—
ARGENTINA					
Duperial S.A.I.C.	San Lorenzo	15	N	Propylene Butadiene Py gas Fuel oils	6 6 6 6
Ipako	Ensenada	15	R	—	—
PASA Petroquimia Arg.	Pto. Gral. San Martin	23	P	—	—
Petroquimica Bahia Blanca	Bahia Blanca	200	E	Propylene Butadiene Py gas	1 10 7
Argentina total		253			
AUSTRALIA					
Altona Petrochem. Co. Ltd.	Altona, Victoria	170	E,G	Propylene Butadiene	50 17
ICI Australia	Botany, NSW	250	N,LPG	Propylene Butadiene Fuel oils Py gas	95 23 16 70
Australia total		420			
AUSTRIA					
OMV A.G.	Schwechat	285	B,N,G	Propylene Butadiene Py gas	150 50 230
BELGIUM					
Petrochem S.A.	Antwerp	502	N	Propylene Butadiene Aromatics Fuel oils Py gas	230 65 230 85 150
BOLIVIA					
Yacimientos Petroliferos Bolivianos	La Paz	230	E,P	Propylene Py gas	56 22
BRAZIL					
Brasiliera de Estireno	Sao Paulo	5	EtOH	—	—
Industrias Quimicas Electro Cloro	Elclor	11	EtOH	—	—
Copene Petroquimica	Camaracari-Bahia	460	N,G	Propylene Butadiene Py gas Aromatics Fuel oils	243 55 341 163 92
Copesul	Triunfo RGS	420	N	Propylene Butadiene Py gas Aromatics Fuel oils	227 66 192 176 80
Coperbo	Cabo	32	EtOH	—	—
Petroquimica Uniao S.A.	Santo Andre	360	N	Propylene Py gas Butadiene Aromatics	204 103 50 312
Salgema Industrias Quimicas S.A.	Maceio-Alagoas	100	EtOH	—	—
Union Carbide	Cubatao	40	EtOH	—	—
Brazil total		1,428			
CANADA					
Alberta Gas Ethylene	Joffre, Alta.	1,224		Propylene Butadiene Py gas	35 51 34
Dow Chemical	Sarnia, Ont.	50	P,B,R	Propylene	—
Imperial(Esso Chemical)	Sarnia, Ont.	220	NGL	Propylene Butadiene Py gas	40 8 25
Petromont	Varnenes, Que.	225	N	Propylene	—
	Montreal East	68	P,R	Propylene Butadiene Py gas Aromatics	60 2 2 6
Polysar Ltd.	Corunna (Sarnia), Ont.	455	E,N,G	Propylene Butadiene Aromatics	330 91 125
Canada total		2,242			
CHILE					
Empressa Nacional Del Petr.	Talcahuano	60	N	—	—
COLOMBIA					
Empresa Colombiana	Barrancabermeja	115	E,R	Propylene Py gas	6 5
FINLAND					
Neste Oy	Porvoo	200	N,G, R,NGL	Propylene Butadiene	90 20
FRANCE					
Atochem & Chloe Chimie	Lacq, Gonfreville, & Feyzin	830	E,N	Propylene Butadiene Aromatics	390 155 330
	Carling St. Avoid	440	N,G	Propylene C_4 Py gas Aromatics Fuel oils	220 140 420 150 80
Copenor	Dunkerque	225	N,G,LPG	Propylene C_4 Py gas Aromatics Fuel oils	110 75 70 80 50
Napthachimie	Lavera	240	LPG,N	Propylene Butadiene	155 50
Shell Chimie	Berre	380	N,G,LH	Propylene Butadiene	190 75
Esso Chimie	Notre Dame de Gravenchon	300	N,R	Propylene Butadiene Py gas	220 70 310
France total		2,415			
GERMANY					
BASF A.G.	Ludwigshafen	450	N	Propylene C_4 Py gas	240 220 264
Deutsche Marathon	Burghausen	200	E,P,N	Propylene Butadiene Benzene	140 84 124
Deutsche Texaco A.G.	Heide	80	N	Propylene C_4	55 28
Erdolchemie G.m.b.H.	Worringen	740	N	Propylene Butadiene Aromatics	520 245 200
Esso Chemie G.m.b.H.	Cologne	450	N	Propylene C_4	240 38
Rheinische Olefinwerke	Wesseling	650	N,G	Propylene Butadiene Py gas	300 150 520
Union Rheinische Braun-Kohlen Krafstoff A.G.	Wesseling	440	N	Propylene C_4 Py gas Fuel oils	260 150 595 165
Ruhr Oel A.G.	Gelsenkirchen	400	N	Propylene	245
Verba Oel	Munchsmunster	200	N	Propylene	130
Chemische Werke Huls	Marl	50	LPG	—	—
Germany total		3,660			
GREECE					
EKO Chemicals Co.	Thessaloniki	15	N	—	—
INDIA					
Alkali & Chemical Corp.	Rishra, W. Bengal	12	EtOH	—	—
Chemicals & Plastics India	Krishnagiri	19	EtOH	—	—
McDowell & Co.	Visakhapatnam	3	EtOH	—	—
India Petrochem Corp.	Baroda	130	N	Propylene Butadiene Benzene Py gas Aromatics	81 22 24 29 20
National Organic Chemicals Industries Ltd.	Thana, Bombay	63	N	Propylene Butadiene	37 7
Polychem Ltd.	Bombay	2	EtOH	—	—
	Nira	4	EtOH	—	—
Reliance Textile Ind.	Bombay	22	N	Propylene Benzene Aromatics Fuel oils	6 3 6 6
India total		252			
IRAN					
Abadan Petrochemical	Abadan	26	R	Propylene	15
ISRAEL					
Oil Ref. Ltd.	Haifa	130	N,R,LPG	—	—

Installed ethylene capacity: 1986* (continued)

Company	Location	Capacity, 1,000 metric tons/year	Feed-stock†	Coproducts	Capacity, 1,000 metric tons/year§
ITALY					
Enichem	Gela	200	E,N	Propylene	160
				Butadiene	40
				Py gas	280
				Aromatics	150
				Fuel oils	55
	Priolo	215	N	Propylene	150
	Brindisi	130	N	Propylene	85
				Butadiene	120
	Porto Tores	240	N	Propylene	121
				Butadiene	50
ICAM	Priolo	550	N,G	Propylene	350
Montedipe	Porto Marghera	350	N	Propylene	180
Italy total		1,485			
JAPAN					
Idemitsu Petrochem Co. Inc.	Tokuyama	380	N	Propylene	220
Maruzen Petrochem Co. Inc.	Goi	373	N	Propylene	220
				Butadiene	55
				Aromatics	240
Mitsubishi Chemical Industries	Mizushima	360	N,LPG	Propylene	216
Mitsubishi Petrochemical Co. Inc.	Kashima	299	N	—	—
	Yokkaichi	211	N	—	—
Mitsui Petrochemical Inds.	Chiba	140	N	Propylene	68
				Py gas	90
				Fuel oils	30
	Iwakuni-Ohtake	92	N	Propylene	69
				Py gas	64
Mizushima-Ethylene	Mizushima	360	N,LPG	Propylene	216
				Py gas	250
				Fuel oils	50
Nippon Petrochemicals	Kawasaki	190	N,LPG	Propylene	148
				Butadiene	50
Osaka Petrochemicals Inds.	Osaka	300	N,B	Propylene	200
				Aromatics	225
Sanyo Ethylene Co.	Mizushima	390	N	Propylene	254
Shin Daikyowa Petrochemical Co.	Yokkaichi	361	N,B,P	Propylene	220
				Py gas	300
				Aromatics	169
Showa Denko, K.K.	Ohita	320	N,LPG	Propylene	170
				Butadiene	45
				Aromatics	160
Sumitomo Chem. Co. Ltd.	Chiba	345	N,LPG	Propylene	259
	Nihama	139	N	Propylene	123
Tonen Petrochemical Co., Ltd.	Kawasaki	350	N,LPG	Propylene	224
				Butadiene	105
Ukishima Petrochem Co. Ltd.	Kawasaki	808	N	Propylene	417
Japan total		5,418			
KOREA					
Honam Ethylene Co.	Yeochun	350	N,G,LPG	Propylene	187
				C_4	129
				Aromatics	155
				Py gas	302
				Fuel oils	98
Yukong Ltd. (formerly Korea Oil)	Ulsan	155	N	Propylene	81
				Butadiene	24
				Aromatics	70
				Fuel oils	18
Korea total		505			
MEXICO					
Petroleos Mexicanos	Congrejera	500			
	Pajaritos	209	E		
	Posa Rica	182	R		
	Reynosa	27	LH		
	Ciudad Madero	14	R		
Mexico total		932			
THE NETHERLANDS					
Dow Chemical Europe	Terneuzan	960	N	Propylene	450
				Benzene	600
				Butadiene	150
DSM	Limburg	800	N,G,LPG	Propylene	450
				Benzene	150
				Butadiene	90
Shell Nederland Chemie BV	Moerdijk	500	N,G	Propylene	300
				Butadiene	115
Netherlands total		2,260			
NORWAY					
I/S Noretyl	Rafnes	300	NGL	Propylene	70
				Py gas	35
PORTUGAL					
Companhia Nacional de Petroquimica	Sines	300	LPG,N	Propylene	140
				Butadiene	42
				Py gas	220
				Fuel oils	24
PUERTO RICO					
Union Carbide Caribe Inc.	Ponce	413	N,LPG	Propylene	227
QATAR					
Qatar Petrochemical	Umm Said	280	E	Propylene	5
SAUDI ARABIA					
Saudi Petrochemical Co.	Al-Jubail	656	E	—	—
Arabian Petrochemical Co.	Al-Jubail	500	E	—	—
Saudi Yanbu Petrochem. Co.	Yanbu	455	E	—	—
Saudi Arabia total		1,611			
SINGAPORE					
Singapore Petro-Chemical	Singapore	300	LPG,N	Propylene	—
SOUTH AFRICA					
So. Africa Coal, Oil & Gas Co.	Sasolburg	150	Syn. gas	Propylene	120
				Butadiene	27
				Aromatics	20
SPAIN					
Dow	Tarragona	350	N	Propylene	130
				Butadiene	50
				Py gas	300
Enpetrol	Puertollano	210	LPG,N,G	Propylene	115
				Butadiene	28
				Py gas	155
				Fuel oils	45
	Tarragona	325	LPG,N	Propylene	150
				Butadiene	45
				Py gas	260
				Fuel oils	70
Industrias Quimicas Asociadas S.A.	Tarragona	71	N	Propylene	36
				Butadiene	7.5
				Aromatics	40
Spain Total		956			
SWEDEN					
Statoil Petrochemie A/B	Stenungsund	365	LPG,N,G	Propylene	165
SWITZERLAND					
Lonza, A.G.	Visp	30	N,LPG	Acetylene	
TAIWAN					
Chinese Petro. Corp.	Koahsiung	899	N	Propylene	469
				Butadiene	128
China Petrochemical Development Corp.	Toufen	54	E	—	—
Taiwan total		953			
TURKEY					
Petkim Petrokimya A.S.	Izmit	55	N	Propylene	40
				C_4	26
				Py gas	58
				Fuel oils	8
	Izmir	300	N	Propylene	88
				C_4	80
				Py gas	250
Turkey total		355			
UNITED KINGDOM					
BP Chemicals	Baglan Bay	340	N	Propylene	200
				Butadiene	60
	Grangemouth	250		Propylene	180
				Butadiene	48
BP/ICI	Wilton	650	N	Propylene	300
				Butadiene	80
Essochem Olefins Inc.	Fawley	105	N,G	Propylene	100
				Butadiene	80
	Fife	500	E		
Shell Chemicals U.K. Ltd.	Carrington	150	N,G,LPG	Propylene	90
				Butadiene	30
U.K. total		1,995			
VENEZUELA					
Pequiven	El Tablazo	150	E,P	Propylene	45
				Aromatics	13
WORLD TOTAL		**46,151**			

*(As of June 1, 1986)

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†Key: E = ethane, P = propane, B = butane, R = refinery streams, N = naphtha, G = gas oil, LH = light hydrocarbons, NGL = natural gas liquids (ethane, propane, butane), LPG = liquefied petroleum gas (propane, butane), EtOH = ethanol

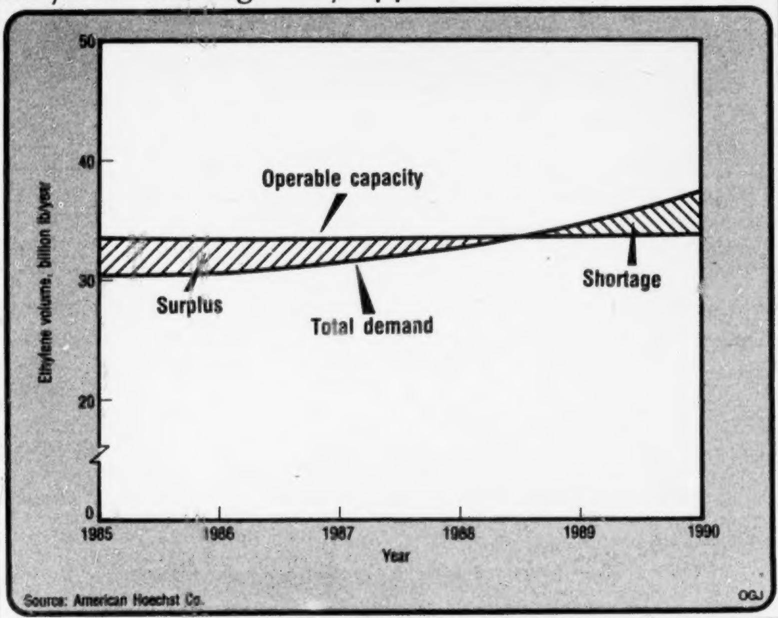
§Coproduct production is only estimated or design quantity. Actual production can vary widely depending on feedstock slate, severity, etc.

Ethylene capacity by country

Area	1,000 metric tons/year		
	1984	1985	1986
North America			
U.S.	17,073	17,298	16,778
Canada	1,561	2,242	2,242
Total	**18,634**	**19,540**	**19,020**
Latin America			
Argentina	253	253	253
Bolivia	230	230	230
Brazil	1,407	1,427	1,428
Chile	60	60	60
Colombia	115	115	115
Mexico	932	932	932
Puerto Rico	413	413	413
Venezuela	150	150	150
Total	**3,560**	**3,580**	**3,581**
Western Europe			
Austria	265	285	285
Belgium	520	520	520
Finland	200	200	200
France	2,270	2,270	2,415
West Germany	3,990	3,990	3,660
Greece	15	15	15
Italy	1,485	1,485	1,485
The Netherlands	2,260	2,260	2,260
Norway	300	300	300
Portugal	300	300	300
Spain	956	956	956
Sweden	350	360	365
Switzerland	30	30	30
U.K.	2,270	2,270	1,995
Total	**15,261**	**15,291**	**14,786**
Asia/Pacific			
Australia	420	420	420
India	252	252	252
Japan	5,995	5,581	5,418
Korea	505	505	505
Singapore	300	300	300
Taiwan	955	953	953
Total	**8,428**	**8,011**	**7,848**
Other			
Algeria	120	120	364
Iran	26	26	26
Israel	24	24	130
Qatar	280	280	280
Saudi Arabia	—	1,611	1,611
South Africa	150	150	150
Turkey	355	355	355
Total	**655**	**2,566**	**2,916**
World total	**46,538**	**48,988**	**48,151**

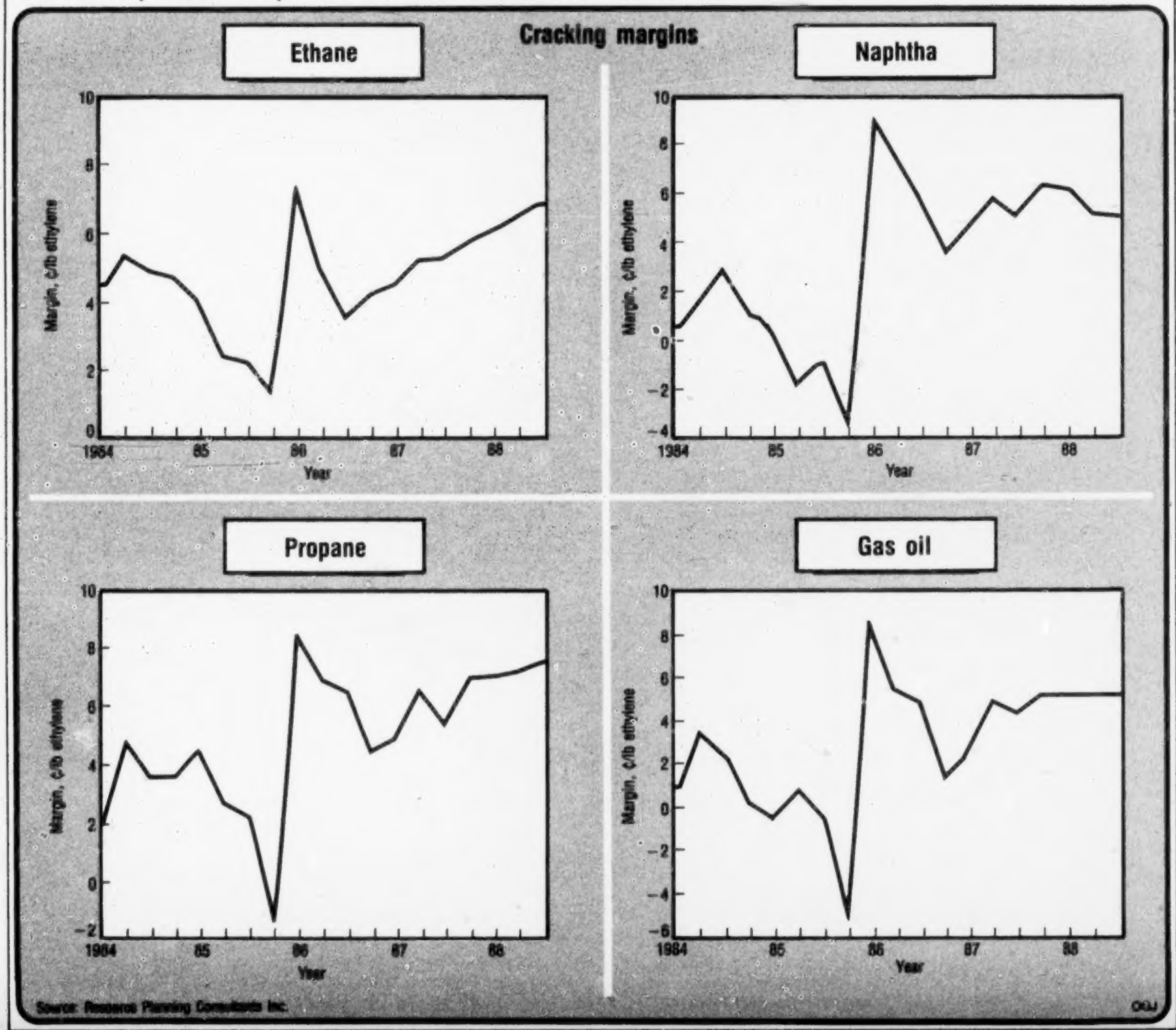
*As of June 1, 1986.

Ethylene shortage may appear in 1988



Source: American Hoechst Co.

Low oil prices depress ethane's feedstock value



Source: Resource Planning Consultants Inc.

OGJ international refining-catalyst compilation

Catalytic naphtha reforming

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
AMERICAN CYANAMID CO.								
Aeroform® PHF-5 & PHF-5A	Monometallic; differing particle size.	Naphtha	Gasoline or BTX	Cyl.	~ 42	Alumina	"P"	Licensees of Amoco Oil's Ultraforming process.
PRHF-30 PRHF-37 PRHF-50 PRHF-58	Bimetallic, but different amounts of active metals	Naphtha	Gasoline or BTX	Cyl.	"P"	Alumina	"P"	Licensees of Amoco Oil's Ultraforming process.
KX-120 KX-130 KX-160	See Exxon Research & Engineering							Licensees of Exxon's Powerforming process.
Trilobe® KX-130	See Exxon Research & Engineering Shaped extrudate							Licensees of Exxon's Powerforming process.
Aeroform® PHF-4 & PHF-4A	Monometallic; different particle sizes.	Naphtha	Gasoline or BTX	Cyl.	~ 42	Alumina	Platinum chloride	✓
Trilobe® P-8 & P-8A	Monometallic, high particle density, shaped catalyst; different particle sizes	Naphtha	Gasoline or BTX	Shaped, ext.	~ 44	Alumina	Platinum chloride	✓
Aeroform® PR-6 & PR-6A	Bimetallic; different particle sizes.	Naphtha	Gasoline or BTX	Cyl.	~ 42	Alumina	Platinum/rhenium/chloride	✓
Trilobe® PR-8, PR-8A & PR-8E	Bimetallic, high particle density shaped catalyst; different particle sizes.	Naphtha	Gasoline or BTX	Shaped ext.	~ 44	Alumina	Platinum/rhenium/chloride	✓
Trilobe® PR-18 & PR-18A	Bimetallic, high particle density shaped catalyst, skewed metals levels; different particle sizes	Low sulfur naphtha	Gasoline or BTX	Shaped ext.	~ 44	Alumina	Platinum/rhenium/chloride	✓
IMP-RNA-2	(See Instituto Mexicano del Petroleo Listing)			Shaped ext.				Licensees of IMP
CHEVRON RESEARCH CO.								
Rheniforming Type F	Latest version, long cycle life stable product yields	Petroleum naphthas (SR and cracked) coal naphthas	Mogas and aromatics	Cyl.	40	"P"	Pt/Re	Licensees Chevron Rheniforming process
Type E	1975 version, improved carrier	"	"	Cyl.	41	"P"	Pt/Re	"
CYANAMID KETJEN								
CK-303 CK-304 CK-305 CK-306	All monometallics, but different active metal contents	Naphtha	Gasoline or BTX	Cyl.	44	Alumina	Platinum/chloride	✓
CK-433	Bimetallic	Naphtha	Gasoline or BTX	Cyl.	44	Alumina	Platinum/rhenium/chloride	✓
CK-522 Trilobe®	Bimetallic, high particle density, shaped catalysts	Naphtha	Gasoline or BTX	Shaped exts.	45	Alumina	Platinum/rhenium/chloride	✓
PHRF-30	Multimetallic	Naphtha	Gasoline or BTX	Cyl.	"P"	Alumina	"P"	Licensees of Amoco Oil's Ultraforming process
CK-473	High-rhenium catalyst	Naphtha	Gasoline or BTX	Cylinder	44	Alumina	Platinum/rhenium/chloride	✓
KX-120 KX-130 KX-160	See Exxon Research & Engineering							Licensees of Exxon's Powerforming process
ENGELHARD CORP.								
E-301	Moderate stability	A-1 naphthas with feed sulfur < 5 ppm wt.	Motor fuel or aromatics	Cyl.	45	Gamma alumina	Platinum	License/sale
E-302	More stable than E-301	All naphthas with feed sulfur less than 10 ppm wt	Motor fuel or aromatics	Cyl.	45	Gamma alumina	Platinum	License/sale
E-311	Maximize LPG production	All naphthas with feed sulfur < 5 ppm wt	LPG and motor fuel	Cyl.	45	Gamma alumina	Platinum	License/sale
E-601	High stability	All naphthas with feed sulfur < 1 ppm wt	Motor fuel or aromatics	Cyl.	45	Gamma alumina	Platinum & Rhenium	License/sale
E-603	High stability. Lower metal loading than E-601.	All naphthas with feed sulfur < 1 ppm wt	Motor fuel or aromatics	Cyl.	45	Gamma alumina	Platinum & Rhenium	License/sale

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
E-611	Very high stability	All naphthas with feed sulfur <0.5 ppm wt	Motor fuel or aromatics	Cyl.	45	Gamma/ Alumina	Platinum Rhenium	License/sale
E-801	Equivalent stability to E603 at higher activity	All napathas with feed sulfur < 1ppm wt.	Motor fuel or aromatics	Cyl.		Gamma/ Alumina	Platinum/ Rhenium	License/✓
E-802	Equivalent stability to E611 at higher activity	All naphthas with feed sulfur <= 0.5 ppm wt.	"	"		"	"	"
E-803	Equivalent stability to E 611 at higher activity with lower metals loading	"	"	"		"	"	"
E-804	Equivalent stability and activity to E-801	"	"	"		"	"	"
(Note: Preceeding catalysts available in higher density at 49.5 lb/cu ft. They are designated HD, for example E – 301 HD).								
EXXON RESEARCH & ENGINEERING CO.								
KX-120	Multimetallic catalyst for semiregen. or cyclic units; different promotor	Virgin/cracked naphthas	High octane motor gas & aromatics	—	—	—	Pt, etc.	Powerforming: Process license through certified vendors.
KX-130	", different promotor	"	"	—	—	—	—	"
KX-160	", different promotor	"	"	—	—	—	—	"
INSTITUTO MEXICANO DEL PETROLEO								
IMP-RNA-1	High activity bimetallic catalyst	Desulfurized naphtha, aromatic production	BTX aromatics, high octane gasoline	Cyl.	0.70 g/cc	Al_2O_3	Pt/Re	Licensees
IMP-RNA-2	"	Desulfurized naphtha, aromatic production	BTX aromatics, high octane gasoline	Trilobe® exts.	0.70 g/cc	Al_2O_3	Pt/Re	"
KATALYSATOREWERKE HUELS AG								
H 2440		Fraction 35-195 °C.	Gasoline, BTX	Cyl. exts.	0.8 kg/l	Al_2O_3	Pt, 0.3-0.8% monometallic	✓
H 6413		"	"	"	0.6 kg/l	"	"	✓
H 2462		"	"	"	0.6 kg/l	"	Pt, 0,3-0,8% + "P"	✓
PROCATALYSE								
RG 402	H.P. reformer	Naphtha	Gasoline	Cyl.		Al_2O_3	Pt 0.6%	✓
RG 412	H.P. reformer	Naphtha	Gasoline	Cyl.		Al_2O_3	Pt 0.35%	✓
RG 422	M.P. reformer	Naphtha	Gasoline	Cyl.		Al_2O_3	Pt 0.6% + Ir	✓
RG 432	M.P. reformer	Naphtha	Gasoline	Cyl.		Al_2O_3	Pt 0.35% + Ir	✓
RG 482	M.P. & L.P. reformer	Naphtha	Gasoline	Cyl.		Al_2O_3	Pt 0.3% + Re	✓
RG 442	Reformer	Naphtha	Gasoline & LPG	Cyl.		Al_2O_3	Pt 0.35% + Ir + promotor	✓
RG 451	Continuous regeneration reformer	Naphtha	Gasoline	Sph.		Al_2O_3	Pt 0.35% + Ir + promotor	✓
CR 201	Continuous regeneration reformer	Naphtha	Gasoline	Sph.		Al_2O_3	Pt 0.35% + Sn	✓
AR 401	Continuous regeneration reformer (Aromizing-IFP)	Naphtha	Aromatics	Sph.		Al_2O_3	Pt 0.6% + promotor	Licensees
UOP INC.								
R-8	Monometallic, oxidized	Unhydrotreated naphtha semi-regenerative	Gasoline, aromatics	Sph.	32	Alumina	Pt	Licensees
R-9	Higher activity monometallic, oxidized	Semi-regen. or swing reactor	Gasoline, aromatics	Sph.	32	Alumina	Pt	Licensees
R-11	Higher activity monometallic, reduced and sulfided	Semi-regen. or swing	Gasoline, aromatics	Sph.	32	Alumina	Pt	Licensees
R-12	Monometallic, higher stability than R-11, reduced and sulfided	Semi-regen.	Gasoline, aromatics	Sph.	32	Alumina	Pt	Licensees
R-55	Monometallic, higher activity and stability than R-12, reduced and sulfided	Semi-regen. or swing	Gasoline, aromatics	Ext.	Dense-loaded 52	Alumina	Pt	Licensees
R-15	Monometallic, reduced and sulfided	Semi-regen.	LPG, gasoline	Sph.	32	Silica/ Alumina	Pt	Licensees
R-16H	Bimetallic, higher stability than monometallics, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	32	Alumina	Pt/Re	Licensees
R-16F	Bimetallic, low Pt, higher stability than monometallics, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	32	Alumina	Pt/Re	Licensees
R16G	Bimetallic, higher activity and stability than R-16F and H, Reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	32	Alumina	Pt/Re	Licensees

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
R-18	Bimetallic, higher activity and stability than R-16 series, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	37	Alumina	Pt/Re	Licensees
R-22	Bimetallic, higher yields than Pt/Re, reduced state	Continuous catalyst regeneration (CCR) or Semi-regen.	Higher production of octane-barrels and aromatics	Sph.	32	Alumina	"P"	Licensees
R-30	Bimetallic, higher yields and activity than Pt/Re, higher Pt than R-32, reduced state.	CCR or swing reactor	"	Sph.	35	Alumina	"P"	Licensees
R-32	Bimetallic, higher yields and activity than Pt/Re, reduced state	CCR	"	Sph.	35	Alumina	"P"	Licensees
R-50	Bimetallic, higher activity and stability than R-16 series, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Ext.	Dense loaded 52	Alumina	Pt/Re	Licensees
R-60	Bimetallic, higher stability than R-50, high activity, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	45	Alumina	Pt/Re	Licensees
R-62	Bimetallic, Lower Pt than R-60, higher stability than R-50, high activity, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	45	Alumina	Pt/Re	Licensees

Dimerization catalysts

PROCATALYSE								
LC 1252		Propylene/ butylene	Gasoline/ hexenes/ octenes	Liquid	—	—	Ni	Licensees IFP Dimersol processe

Isomerization C_4 catalysts

BP								
BP Isom	High activity, regenerable		Cyl.		Alumina	Platinum/ chloride	Licensees of BP	Isomerization process
UOP INC.								
I-4	High activity for n-butane isomerization to iso-butane			Sph.	33.5	Alumina	Pt	Licensees
I-8	Higher activity than I-4 for n-butane isomerization to iso-butane			Ext.	50	Alumina	Pt	Licensees
ENGELHARD CORP.								
RD-290C	Regenerable			Cyl.	48	Alumina	Pt	Sale to BP C_4 Isomerization process licensees

Isomerization (C_5 & C_6) catalysts

BP								
BP Isom	High activity, low pressure operation, regenerable	C_5 and/or C_6 fractions		Cyl.		Alumina	Platinum/chloride	Licensees of BP Isomerization process
ENGELHARD CORP.								
RD-290C	Regenerable	C_5 and/or C_6 paraffins		Cyl.	48	Alumina	Pt	Sale to BP C_5/C_6 isomerization process licensees
UNION CARBIDE CORP.								
HS-10	Non-chloride activated catalyst with high tolerance for feed impurities	Isom. of C_5/C_6 fraction for octane upgrading		Cyl.	46	Molecular sieve /alumina	Pt	Licensees of Hysomer Process or Total Isomerization Process (TIP)
UOP INC.								
I-4	High activity catalyst	Desulfurized LSR fractions; reformate light fractions		Sph.	34	Alumina	Pt	Licensees
I-7	High activity, sulfur and water tolerant	SR or HDT, Ext. C_5/C_6 streams		Ext.	35	"P"	Pt	
I-8	High activity catalyst for low pressure application	"		Cyl.	50	Alumina	Pt	Licensees

Isomerization (xylenes) catalysts

ENGELHARD CORP.								
O-750	Isomerizes ethyl-benzene to xylenes	C_8 aromatics	Para-xylene and/or ortho-xylene	Cyl.	"P"	"P"	Platinum	Octafining II process licensees

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
UOP INC.								
I-9	High activity & high selectivity. High ethylbenzene conversion	Mixed xylenes, ethylbenzene from reformate or pygas	Para-xylene	Sph.	38	"P"	"P"	Licensees

Fluid catalytic cracking

AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS								
Ketjen Low-Coke* series	Low delta coke, low generation temp.	Normal FCC feed, light resid	Gasoline, middle destil., alkyl feedstock	M.S.	0.78/0.82 g/cc		Low RE zeolite	✓
KLC-83	ASTM-MAT.: 73 wt%, S.A.: 170 sq m/g	"	"	"	0.82 g/cc		"	"
KLC-85	ASTM-MAT.: 76 wt%, S.A.: 190 sq m/g	"	"	"	0.80 g/cc		"	"
KLC-87	ASTM-MAT.: 79 wt%, S.A.: 210 sq m/g	"	"	"	0.78 g/cc		"	"
MZ-7 series	Low delta coke, low regenerator temp.	Conventional feed, light resid	Gasoline, alky. feedstock	microsph.	0.82 g/cc (ABD)		zeolite	✓
MZ-7	ASTM-MAT*, 72 wt%; surface area, 120 sq m/g	"	"	"	"		"	✓
MZ-7X	ASTM-MAT, 78; wt% surface area, 140 sq m/g	"	"	"	"		"	✓
MZ-7 Super	ASTM-MAT, 83 wt%; surface area, 180 sq m/g	"	"	"	"		"	✓
Ketjen Multi-Crack* series	Maximum total distillates, bottoms conversion	VGO resid	Gasoline, LCO/ octane-cetane	M.S.	0.78-0.80 g/cc	Active matrix	Low RE zeolites	✓
KMC-23	ASTM-MAT.: 78 wt%, S.A.: 200 sq m/g	"	"	"	0.80"	"	"	"
KMC-25	ASTM-MAT.: 80 wt%, S.A.: 220 sq m/g	"	"	"	0.78"	"	"	"
KMC-27	ASTM-MAT.: 82 wt%, S.A.: 240 sq m/g	"	"	"	0.76"	"	"	"
KMC-55	ASTM-MAT.: 80 wt%, S.A.: 245 sq m/g	"	"	"	0.78"	"	"	"
MZ-11 series	Maximum total distillates, bottoms conversion	VGO and similar; resid and passivator	Gasoline and LCO, low cycle oil densities. Octane & cetane.	microsph.	0.75 g/cc (ABD)		zeolite matrix	✓
MZ-101	ASTM-MAT*, 72 wt%; surface area, 160 sq m/g	"	"	"	"		"	✓
MZ-11	ASTM-MAT, 76 wt%; surface area, 180 sq m/g	"	"	"	"		"	✓
MZ-11X	ASTM-MAT, 78 wt%; surface area, 200 sq m/g	"	"	"	"		"	✓
MZ-11 Super	ASTM-MAT, 80 wt%; surface area 220 sq m/g	"	"	"	"		"	✓
Ketjen Octa-Boost series	High octane, low coke and gas	VGO, heavy resid	High severity octane, high severity resid	M.S.	0.73/0.77 g/cc	matrix	Ultra stable zeolites	✓
KOB-605	ASTM-MAT.: 67 wt%, S.A.: 240 sq m/g	"	"	"	0.75"	"	"	"
KOB-607	ASTM-MAT.: 70 wt%, S.A.: 270 sq m/g	"	"	"	0.73"	"	"	"
KMC-25 plus/y	ASTM-MAT.: 73wt%, S.A.: 230 sq m/g	"	"	"	0.77"	"	Ultra stable low RE zeolites	"
Ketjen Metal-Resist* series	Metal resistance, bottoms conversion, low delta coke	High metals, heavy resids	LCO octane	M.S.	0.75/0.87 g/cc	V + Ni trap	Low RE zeolites	✓
KMR-903	ASTM-MAT.: 73 wt%, S.A.: 190 sq m/gr	"	"	"	0.87"	"	"	"
KMR-905	ASTM-MAT.: 77 wt%, S.A.: 210 sq m/gr	"	"	"	0.85"	"	"	"
KMR-907	ASTM-MAT.: 81 wt%, S.A.: 230 sq m/gr	"	"	"	0.83"	"	"	"
KMR-series	Max. metal resistance bottoms conversion low delta coke	Metal rich resid other heavy feeds	Low cycle oil densities	microsph.	0.75 g/cc (ABD)		zeolite, V-trapping matrix	✓
KMR-93	ASTM-MAT*, 72 wt%; surface area, 160 sq m/g	"	"	"	"		"	✓
KMR-95	ASTM-MAT, 78 wt%; surface area, 190 sq m/g	"	"	"	"		"	✓
KMR-97	ASTM-MAT, 83 wt%; surface area 220 sq m/g	"	"	"	"		"	✓

* Conversion after 100% steam deactivation for 17 hr at 750° C.

CATALYSTS & CHEMICALS INDUSTRIES CO., LTD.								
MRZ-210	Low activity and high liquid yield	FCC feed	Gasoline & LCO	Microsph.	0.74 g/cc	Sio_2/Al_2O_3	Zeolite	✓
MRZ-220	High liquid yield	"	"	"				
MRZ-230	"	"	"	"				
MRZ-203	High octane & high metals tolerance	FCC feed	Gasoline	Microsph.	0.74 g/cc	Sio_2/Al_2O_3	Zeolite	✓
MRZ-204	"	n	"	"	"	"	"	
MRZ-206	"	"	"	"	0.72 g/cc	"	"	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
MRZ-203S	High octane, high metal tolerance & high hydrothermal stability	FCC feed & high metals feedstocks	Gasoline	Microsph	0.74	SiO_2/Al_2O_3	Zeolite	
MRZ-204S	"	"	"	"	"	"	"	
MRZ-206S	"	"	"	"	0.70	"	"	
MRZ-240	High gasoline yield & high metal tolerance	FCC feed & high metals feeds	Gasoline	Microsph.	0.74 g/cc	SiO_2/Al_2O_3	Zeolite	✓
MRZ-260	"	"	"	"	0.70	"	"	
MRZ-060	"	"	"	"	0.70 g/cc	"	"	✓
SZ-C	Low active & high octane	FCC feed	Gasoline	Microsph.	0.45g/cc	"	"	
SZ-H	"	"	"	"	0.42	"	"	
HA	"	"	"	"	0.42	"		
DAVISON CHEMICAL DIVISION, W. R. GRACE & CO.								
CBZ-1*	General purpose, increased LCO yield	Gas oil, mild resid	Gasoline & distillate	Microsph.	0.55 g/cc (ABD)	"P"	Zeolite/Matrix	✓
CBZ-4	"	"	"	"	0.58 g/cc (ABD)	"P"	"	✓
DA-440*	Maximum unit retention, high stability, bottoms cracking	Gas oil, resid	Gasoline & distillate	Microsph.	0.79 g/cc (ABD)	"P"	Zeolite/Matrix	✓
DA-400	"	"	"	"	0.80	"	"	"
DA-300	"	"	"	"	0.82	"	"	"
DA-250	"	"	"	"	0.85		"	"
DA-200	"	"	"	"	0.85	"	"	"
DAB-400*	Maximum retention and bottoms upgrading, high stability	Gas oil, resid, coker gas oils, high nitrogen feeds	Gasoline & distillate	Microsph.	0.80 g/cc (ABD)	"P"	Zeolite/Matrix	✓
DAB-300	"	"	"	"	0.82 "	"	"	"
DAB-250	"	"	"	"	0.84 "	"	"	"
DZ-8	General purpose, bottoms cracking, low ABD for circulation sensitive units	Gas oil, mild residu	Gasoline & distillate	Microsph.	0.54 g/cc (ABD)	"P"	Zeolite/Matrix	✓
*Catalyst arranged in decreasing order of activity.								
GX-30*	Bottoms cracking, nitrogen and metals tolerance	Gas oil, resid, coker gas oils, high nitrogen feeds	Gasoline & distillate	Microsph.	0.73 g/cc (ABD)	"P"	Zeolite/Matrix	✓
GX-20	"	"	"	"	0.76	"	"	"
GX-10	"	"	"	"	0.78	"	"	"
*Catalysts arranged in decreasing order of activity								
GXO-28*	Octane enhancement, bottoms coker cracking, coke selectivity, excellent stability	Gas oil, resid, gas oils, high nitrogen feeds	Gasoline & distillate	Microsph.	0.75 g/cc (ABD)	"P"	Zeolite/Matrix	✓
GXO-40	"	"	"	"	0.75	"	"	"
GXO-25+	"	"	"	"	0.76	"	"	"
GXO-25	"	"	"	"	0.76	"	"	"
GXO-27	"	"	"	"	0.77	"	"	"
*Catalysts arranged in decreasing order of activity								
Super Nova-D*	Coke selectivity, octane enhancement, stability, maximum unit retention, bottoms cracking	Gas oil, resid, coker gas oils, high nitrogen feeds	Gasoline & distillate	Microsph.	0.76 g/cc (ABD)	"P"	Zeolite/Matrix	✓
Nova-D	"	"	"	"	0.78 g/cc (ABD)	"	"	"
*Catalysts arranged in decreasing order of activity.								
Nova-SX*	Coke and gas selectivity at moderate cost	Gas oil, resid	Gasoline & distillate	Microsph.	0.75 g/cc (ABD)	"P"	Zeolite/Matrix	✓
Nova-S	"	"	"	"	"	"	"	"
*Catalyst arranged in decreasing order of activity.								
Octacat+*	Maximum octane enhancement and stability, minimum coke make	Gas oil, resid, coker gas oils	Gasoline & distillate	Microsph.	0.68 g/cc (ABD)	"P"	Zeolite/Matrix	✓
Octacat	"	"	"	"	0.68	"	"	"
Octacat-2	"	"	"	"	0.70	"	"	"
Octacat-3	"	"	"	"	0.72	"	"	"
*Catalysts arranged in decreasing order of activity.								
Octacat-D*	Maximum retention version of octacat series with improved bottoms cracking	Gas oil, resid, coker gas oils, high nitrogen feeds	Gasoline & distillate	Microsph.	0.74 g/cc (ABD)	"P"	Zeolite/Matrix	✓
Octacat-D2	"	"	"	"	0.76	"	"	"
Octacat-D3	"	"	"	"	0.78	"	"	"
*Catalysts arranged in decreasing order of activity.								
RC-25*	High liquid product selectivity, high isobutane yield, metals tolerance	Gas oil, resid	Gasoline, distillate	Microsph.	0.73 g/cc (ABD)	"P"	Zeolite/Matrix	✓
Super-D Magnum	"	"	"	"	0.73	"	"	"
Super-D Extra	"	"	"	"	0.75	"	"	"
Super-D	"	"	"	"	0.76	"	"	"
Super-D2	"	"	"	"	0.77	"	"	"
Super-D3	"	"	"	"	0.78	"	"	"
Super-D4	"	"	"	"	0.80	"	"	"
*Catalysts arranged in decreasing order of activity.								
Titan	Moderate activity, low-priced catalyst for metals contaminant control	Gas oil, resid	Gasoline & distillate	Microsph.	0.79 g/cc (ABD)	"P"	Zeolite/Matrix	✓

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Additive O	Additive for gasoline octane enhancement	Gas oil, resid	High octane gasoline	Microsph.	0.70 g/cc (ABD)	"P"	Zeolite/Matrix	✓
DVT	Additive for vanadium and passivation	Resid	Maintain conversion liquid product selectivity	Microsph.	0.62 g/cc	"P" (ABD)	Matrix	✓
CROSFIELD CATALYSTS								
CBZ1, 2, 3, 4	(See Davison Chemical listing)							✓
Super D, D2, D3, D4, Super D Extra	(See Davison Chemical listing)							✓
XL series	Retention by increased density and attrition resistance Hydrothermal stability, high coke selectivity and resistance to metals poisoning. Reduced SOX emissions, four activity levels	Gas oils	High gasoline yield and LCO make. Reduced slurry yields. Octane, diesel yield					✓
XL-60	"	"	"	Microsph.	0.87 g/ml (ABD)	Silica alumina	Zeolite + matrix	✓
XL-80	"	"	"	microsph.	0.87 g/ml (ABD)	"	"	✓
XL-90	"	"	"	microsph.	0.86 g/ml (ABD)	"	"	✓
XL-100	"	Gas oils	"	microsph.	0.85 g/ml (ABD)	"	"	✓
XLS-1	High hydrothermal stability and metals tolerance, three activity levels	Gas oil and residual oils	Selectivity for gasoline and LCO	microsph.	0.85 g/ml (ABD)	Silica alumina	Zeolite + matrix	✓
XLS-2	"	"	"	"	0.86 g/ml (ABD)	"	"	✓
XLS-3	"	"	"	"	0.87 g/ml (ABD)	"	"	✓
SLS-60	High coke selectivity, octane enhancement, 3 activity levels	Gas oils and residual oils	Selectivity for gasoline and LCO	Microsph.	0.78 g/ml	Silica alumina	Zeolite + matrix	✓
SLS-80	"	"	"	"	0.76 g/ml	"	"	✓
SLS-100	"	"	"	"	0.76 g/ml	"	"	✓
Quantum	Maximum octane enhancement	Gas oils and residual oils		"	0.73 g/ml	"	"	✓
CBZ-1, 2, 3, 4	(See Davison Chemical listing)							
Super D, D2, D3, & Super D Extra D4,	(See Davison Chemical listing)							
ENGELHARD CORP.								
ULTRASIV®-280/280P ULTRASIV®-260/260P ULTRASIV®-250/250P ULTRASIV®-240/240P ULTRASIV®-230/230P ULTRASIV®-220/220P	US-280 highest activity, US-220 lowest activity, all grades available with CO promotion version designated by the letter "P" following the number.	Gas oils, Gas oil-resid mixtures, resids	Incremental resid processing catalyst, Vanadium tolerance, low coke, low gas, attrition resistance.	Microsph.	1.1 g/cc	In-situ sillica/alumina	Zeolite, moderate rare earth, moderate surface area	✓
HEZ-55™ / EPZ®-55 HEZ-54™ / EPZ®-54 HEZ-53™ / EPZ®-53 HEZ-52™ / EPZ®-52 HEZ-50™ / EPZ®-50	HEZ-55 highest activity, HFZ-50 lowest activity EPZ designates CO promoted versions	Gas oils, high nitrogen gas oils, California gas oils	Bottoms upgrading catalyst, octane barrels and cetane	Microsph.	1.0 g/cc	"	Zeolite, moderate rare earth, high surface area	✓
MAGNASIV®-380/380P MAGNASIV®-370/370P MAGNASIV®-360/360P	MAG-380 highest activity, MAG-360 lowest activity Letter "P" designates CO promoted versions	Gas oils, Gas oil-resid mixtures resids-High nitrogen gas oils. California gas oils, coker gas oils	Low coke and gas yields, metal tolerance of ULTRASIV-plus bottoms upgrading and nitrogen tolerance of HEZ series	Microsph.	1.05 g/cc	"	Zeolite, high rare earth, moderate surface area	✓
OCTISIV®-PLUS/P OCTASIV®-130/130P OCTASIV®-120/120P	OS-Plus highest activity, stability & metals tolerance. OS-130 intermediate activity/stability. OS-120 lowest activity. Letter "P" designates Co promoted versions	Gas oils, Gas oil-resid mixtures, resids	Selective octane catalysts for high octane without gasoline penalty. OS-Plus formulated for resid applications.	Microsph.	1.1 g/c	In-situ Silica/alumina	Zeolite low, no rare earth. Moderate surface area	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
ULTRASIV®-450/450P ULTRASIV®-440/440P ULTRASIV®-430/430P	US-450 Highest activity. US-430 lowest activity Letter "P" designates CO promoted versions	"	US 200 series liquid selectivity with different physical & chemical properties for circulation sensitive units. Reduced CO_2-CO ratio for partial oxidation units. Reduced H_2 yields, lower coke than US-200 series.	Microsph.	1.0 g/cc	In-situ Silica/ Alumina	Zeolite, high rare earth. Low surface area	✓
ULTRASOX™/-P	Available in a variety of cracking & sulfur reduction activities to match unit objectives. Letter "P" designates CO promoted versions.	High sulfur gas oils, gas oil-resid mixtures	SOx reduction together with cat. features of ULTRASIV series.	Microsph.	1.1 g/cc	In-situ Silica/ Alumina	Zeolite/Proprietary SOx reduction features	✓
HFZ®-33/33P HFZ®-20/20P HFZ®-23/23P HFZ®-25/25P	HFZ-33 highest activity, HFZ-25 lowest activity Letter "P" designates CO promoted versions	Gas oils	Olefins for chemical feedstocks, high octane/cetane	Microsph.	1.0 g/cc	In-situ silica/ alumina	Zeolite. No rare earth. High surface area	✓
Ultradyne® 980/ 980P, 970/970P, 960, 950, 940, 930	UD980 is highest activity/P for CO promoted grade	Gas oil	Low coke production, low gasoline bromine number, high gasoline yield, low dry gas yield	Microsph.	1.0	In situ silica/ alumina	Zeolite	✓
Dynacat® 1080/P, 1070, 1060, 1050, 1040, 1030	DC 1080 is highest activity/P for CO promoted grade	Resid, high metals gas oil	High activity maintenance under metal contaminated situations (same selectivity as above)	"	"	"	"	✓
Dynasiv® 780/P, 770, 760, 750, 740, 730	DS 780 is highest activity/P for CO promoted grade	Gas oil/ mild resid	Moderate octane, good bottoms upgrading, high gasoline selectivity	"	"	"	"	✓
Dynasiv Plus® 880/P, cement, 870, 860, 850, 840, 830	DSP880 is highest activity/P for CO promoted grade	Gas oil/ resid	Octane enhan- regen. temp. reduction, good gasoline selectivity, good bottoms upgrading	"	"	"	Ultrastabilized zeolite	✓
Octidyne® 1170/P, 1160, 1150, 1140, 1130	OP1170 is highest activity/P for CO promoted grade	Gas oil/ resid	Maximum octane production, maximum cetane, good gasoline selectivity, reduced regenerator temp.	"	"	"	"	✓
Ultrasox® 1280/P	USX-1280 highest activity for CO promoted grade. All have substantial SOx reducing capacity	Gas oil/ resid	Maximum SOx reduction capability built into a single catalyst, good gasoline selectivity and bottoms upgrading	"	"	"	Zeolite	✓
DynaSox® 1380/P. 1340, 1370, 1360, 1350 1330	DSX 1380 is highest activity/P for CO promoted grade	Gas oil/ resid	Moderate SOx reduction built into single catalyst Good gasoline selection and bottomsupgrading	" "	" "	In situ "	Zeolite "	✓ "
Nitrodyne® 1490	ND1490 extremely high activity FCC catalyst	High N feeds, coker gas oils	High in-unit activity, excellent conversion, bottoms upgrading					
HARSHAW/FILTROL								
FGO-1 FGO-2 FGO-3	General purpose, three activity levels—"3" highest	Gas oils or high metals resid (blending catalyst)	All-around balance	Microsph.	0.80 g/cc (ABD)	Active alumina	Rare-earth exchanged y-faujasite	- ✓
OCTEX-1 OCTEX-2 OCTEX-3	High octane gasoline. Three activity levels—"3" highest	Gas oils or light resid	High gasoline yields & O.N. low coke, high LCO cetane No.	"	"	"	"	✓
ROC-1 ROC-25 ROC-50	Resists metals, Low coke make, Highest Activity. Three activity levels.	Heavy gas oil, high metals resids. High temp. Transfer line cracking	High gasoline yield & O.N. low coke & D.O., high cetane	"	"	"	"	✓

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
HMT FSS-1 FSS-2	Rugged, all purpose. Three activity levels—"2" highest	Unusually severe steaming or temp. condition, nitrogen resistant	High gasoline yield & O.N., low coke	"	"	"	"	✓
SOC-1 SOC-2	Resist metals, rugged. Two activity levels—"2" highest	HGO, high metals resid, severe conditions	High gasoline yield & O.N., low coke, high cetane	"	"	"	"	✓
MOC-1 MOC-2	Resist metals, low coke, rugged. Two activity levels—"2" highest	HGO, high metals resids. Severe deactivating conditions	High gasoline, O.N. High LCO cetane, low coke and D.O.	"	"	"	"	✓
OC	Octane-type catalyst, low cost/limited production	Gas oils through light resids	High gasoline yield & O.N., low coke & D.O.	"	"	"	"	✓
DOC-1	Diesel oil production	Gas oils resids.	High LCO yield with high cetane	"	"	"	"	✓
FOCUS	High octane gasoline, low gas and coke make, wide applicability, has ultrastable Y zeolite	Gas oils through resids, outstanding low gas yield	Extra yield of highest ON gasoline, minimize gas, decanted oil yields	Microsph.	0.80 g/cc (ABD)			Low rare earth in ultrastable Y-Faujasite
FSS-Y	Rugged, all purpose including high metals and ultra high regen. temp. applications, has ultrastable Y zeolite	Heavy gas oils through high metals resids, resists vanadium poisoning	High octane gasoline with standing yields	"	"			High rare earth, ultrastable Y-Faujasite
ZSM-5	Octane enhancing additive	Broad applicability, largest gain on paraffinic type feeds	Octane improvement, particularly in presence of extra alky plant capacity	"	"			Licensed, shape selective zeolite
KATALISTIKS, INC.								
Delta-400	Maximum research and motor octane without yield penalty	Gas oil, resid, reduced crude	High liquid, maximum mid-barrel yield. Low 650+ yield.	Microsph.	0.74 g/cc (ABD)	Silica Alumina	USY Zeolite & low surface area matrix	
Delta-300	"	"	", and coke yields	"	0.76 g/cc (ABD)	"	"	
Sigma-200 Plus	Excellent for max-distillate operation	"	High liquid, maximum mid-barrel yield. Low 650+ yield and low gas attrition resistance.	"	0.76 g/cc (ABD)	"	High silica, low rare earth zeolite and matrix.	
Sigma-300 Plus	Flexible for max-distillate or max gasoline operation	"	"	"	0.75 g/cc (ABD)	"	"	
Sigma-400 Plus	Maximum octane bbls.	"	"	"	0.74 g/cc (ABD)	"	"	
Sigma-600 Plus	Maximum octane bbls. and esp. for high severity operations	"	"	"	0.72 g/cc (ABD)	"	"	
BMZ-200	Max distillate yield	Gas oil, resid, reduced crude, high nitrogen, coker gas oil	High liquid, maximum mid-barrel yield. Low 650+ yield and low gas. Attrition resistance. Low bromine number. High isobutane yield.	Microsph.	0.76 g/cc (ABD)	Silica Alumina	High silica, fully rare earth exchanged zeolites & low surface area matrix.	
BMZ-300	Flexible for max distillate or max gasoline	"	"	"	0.75 g/cc (ABD)	"	"	
BMZ-400	Maximum gasoline yields for severe operations	"	"	"	0.74 g/cc (ABD)	"	"	
BMZ-600	Maximum metals tolerance and hydrothermal stability	"	"	"	0.72 g/cc (ABD)	"	"	
Sigma-200	General purpose, low activity	"	", balanced butane yields	"	0.76 g/cc (ABD)	"	Mixed prem. quality zeolite & low surface area matrix	
Sigma-300	General purpose, intermediate activity	"	"	"	0.75 g/cc (ABD)	"	"	

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
Sigma-400	General purpose, high stability	Gas oil, resid, reduced crude, high nitrogen coker and gas oil	High liquid, maximum mid-barrel yield. Low 650+ yield and low gas. Attrition resistance. Low bromine number. Balanced butane yields.	Microsph.	0.74 g/cc (ABD)	Silica/Alumina	Mixed prem. quality zeolite & low surface area matrix	
Sigma-600	General purpose, highest activity & stability	"	"	"	0.72 g/cc (ABD)	"	"	
EKZ-2	General purpose, low activity	Gas, dirty feeds, coker gas oils	High liquid yield, low gas and coke	"	0.79 g/cc (ABD)	"	Fully REO exchanged zeolite	
EKZ-3	General purpose mod. activity	"	"	"	0.78 g/cc (ABD)	"	"	
EKZ-4	General purpose, high activity	"	"	"	0.76 g/cc (ABD)	"	"	
Ekonokat-1	General purpose, and activity, excellent for metals control	"	High liquid yield, low gas and coke and low 650+ yield.	"	0.76 g/cc (ABD)	"	Mixed zeolite and low surface area matrix	
Ekonokat-2	General purpose, mid-range activity, excellent for metals control	Gas oil, dirty feeds, coker gas oils	High liquid yield, low gas and coke and low 650+ yield	Microsph.	0.72 g/cc (ABD)	Silica/Alumina	Mixed zeolite and low surface area matrix	
KX-100	Maximum vanadium tolerance	Resids	High liquid yields, low coke and gas yields	"	0.76 g/cc (ABD)	"P"	"P"	
KX-431	Maximum octane bbl	Gas oils, resids, reduced crudes	High liquid, mid-bbl yields. Low gas, coke and 650+ yields.	"	0.74 g/cc (ABD)	Silica/Alumina	High silica, low rare earth zeolite and matrix	
KX-419	Maximum research and motor octane	"	"	"	0.74 g/cc (ABD)	"	High silica zeolite & matrix	
W. R. GRACE CATALYSTS PTY. LTD.								
LA 65	Low alumina, matrix cracking, low activity	Gas oil cracking	Transport fuels	Microsph.	0.47 g/cc (ABD)	Silica-alumina	Silica-alumina	✓
HA 65	High alumina, matrix cracking, low activity	Gas oil cracking	"	"	0.49 g/cc (ABD)	"	Silica-alumina	✓
HAY 5	High alumina matrix and zeolite cracking	Gas oil cracking	"	"	0.49 g/cc (ABD)	"	Silica-alumina + zeolite	✓
HAY 10	More conversion than HAY 5. Greater activity and increased selectivity	Gas oil cracking	"	"	0.50 g/cc (ABD)	"	Silica-alumina + zeolite	✓
HAY 15	More conversion than HAY 10.	Gas oil cracking	"	"	0.50 g/cc (ABD)	"	Silica-alumina + zeolite	✓
HAY 20	More conversion than HAY 15.	Gas oil cracking	"	"	0.50 g/cc (ABD)	"	Silica-alumina + zeolite	✓
Other, CP-3, Additive R	(See Davison Chemical Division, W. R. Grace & Co. listing)							

Hydrocracking

AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS								
Ketjenfine LC-fining	(See Lummus Crest "Hydrocracking" listing)							
AMERICAN CYANAMID CO.								
IPB-2		AGO & VGO	Gasoline & distillates	Cyl.		"P"	"P"	Licensees of Shell Oil Hydrocracking Process
HC-102	(See Unocal "Hydrocracking" listing)							Licensees of Unocal's Unicracking process
MD-2	(See British Petroleum Listing)							Licensees of BP Hydrocracking Process
HDS-1442B	Ebullating bed catalyst	Resid hydrotreating		Cyl.	~ 34	Alumina	C_0O/MoO_3	Licensees of H-Oil and LC-Fining processes
HDS-1443B	"	"		"	~ 36	"	NiO/MoO_3	"
GHC	(See Gulf Research "Hydrocracking" listing)							H-G or Gulf Hydrocracking process licensees
DHC	"							"
ARCO PETROLEUM PRODUCTS CO.								
ARCO H-H Cat		Raw lube stocks	High quality lube products	Cyl.	48			Licensees of Arco H-H Lube Oil Process
BP								
MD-2		VGO	High selectivity for middle distillates	Cyl.		"P"	"P"	Licensees of BP Hydrocracking Process

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BASF AG								
M 8-80	Raffination and hydrocracking	HGO,VGO	Middle distillate, steamcracker feed	Cyl. extr.	Approx. 0.70 kg/l	Amorph. alumina-silicates	NiO MoO_3	BASF licensees
M 8-81	Hydrocracking	"	"	"	Approx. 0.68 kg/l	"	"	"
M 8-85	"	"	middle distillate, steamcracker feed, kerosene	"	approx. 0.72 kg/l	zeolite	"	"
M 0-80	"	"	naphtha	"	approx. 0.60 kg/l	"	Pd	"
CHEVRON RESEARCH CO.								
ICR 106	High hydrodenitrogenation activity, high cracking activity	VGO, CGO, LCO, AGO	Diesel, jet, naphtha, Isocracker second stage feed	Cyl.	63	"P"	"P"	Licensees Chevron Isocracking Process
ICR 120	Max. diesel yield	"	"	Cyl.	63	"P"	"P"	"
ICR 126	Longer life	"	"	Cyl.	58	"P"	"P"	"
ICR 113	Lower cost	" + Deasphalted oil	"	Cyl.	48	"P"	"P"	"
ICR 117	Naphtha yield	VGO, CGO, LCO, AGO	Naphtha, jet, diesel, Isocracker second stage feed	Cyl.	58	"P"	"P"	"
ICR 202	High activity and selectivity	Hydrofined VGO, CGO, and LCO	Reformer feed light naphtha, jet fuel, isobutane	Cyl.	61	"P"	"P"	Licensees Chevron Isocracking Process
ICR 204	Long cycle life	"	"	Cyl.	52	"P"	"P"	"
GULF RESEARCH & DEVELOPMENT CO.								
GHC	Maximum gasoline oriented hydrocracking	Distillates and light gas oils	Gasoline, naphtha, kerosene and jet fuel	Cyl.	50-60	Silica Alumina	"P"	H-G or Gulf Hydrocracking Process licensees through Gulf approved vendor
DHC	Maximum distillate oriented hydrocracking	Distillates and light and heavy vacuum gas oils	Furnace oil, diesel, jet fuel and kerosene	Cyl.	50-60	Silica Alumina	"P"	H-G or Gulf Hydrocracking Process licensees through Gulf approved vendor
KATALCO CORP.								
KAT-4000	Active metal	Atm. & Vac. residua		Cyl.	34	Alumina	Cobalt/molybdenum	✓
KAT-5000	Active metal	"		Cyl.	34	"	Nickel/molybdenum	✓
LUMMUS CREST INC.								
LC-Fining	Accommodates heavy feeds, high tolerance for metals loading	Atm. bottoms, vacuum bottoms, heavy crudes, tars shale, coal liquids, deasphalter pitch	Produces distillates, low sulfur fuel	Cyl. exts.	Relatively low	Alumina	CoMo or NiMo	Sale to LC-Fining licensees by American Cyanamid, Ketjen & Davison Chemical
SHELL CHEMICAL								
S 324	Dentrification and single stage hydrocracking.	Coal oil hydrocracking and single stage hydrocracking		Ext.	0.86 g/cc	Alumina	Ni/Mo/P	✓
S 324T	"	"		Trilobe*	0.80 g/cc	"	"	"
S 327	High desulphurization enhanced resistance against metals	Pretreatment of cat cracker feed		Ext.	0.80 g/cc	Alumina	Ni/Mo/P	✓
S 653	Second stage hydrocracking	VGO to naphtha and middle distillates		Ext.	"	Silica/alumina	Ni/W	✓
S-753	"	"		"	0.70 kg/l	Crystalline silica/alumina		
S 354	Hydrocracking of heavy distillates			Ext.	1.02 g/cc	Alumina	Ni/W/P	✓
S 454	Hydrocracking of heavy distillates			Ext.	1.05 g/cc	Alumina	Ni/W	✓
UOP INC.								
DHC-2	Bifunctional catalyst, very strong hydrogenation function, good cracking activity	VGO, DAO, CGO other non-straight run gas oils	High selectivity to middle distillates	Sph.	41	Amorphous	"P"	
DHC-6	Bifunctional catalyst, good hydrogenation function, very good cracking activity	"	"	Sph.	44	Amorphous	"P"	

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
DHC-8	Bifunctional catalyst, good hydrogenation function, very good cracking activity, improved temperature stability	"	"	Sph.	44	Amorphous	"P"	
HC-8	Second stage high activity cracking catalyst. Very active and stable	"	High selectivity to naphtha	Cyl.	42	Zeolite	"P"	
HC-100	Second stage high activity cracking catalyst. Much more active than HC-8	"	"	"	48	Zeolite	"P"	
HC-101	High activity cracking catalyst. Srtong hydrogenation function	Naphtha "	High selectivity to LPG	"	50	Zeolite	"P"	
RCM-3	High activity catalyst approved for use in ebullating bed resid conversion units, high strength spheres	Vacuum residua	Naphtha, distillates, and gas oils	Sph.	41	"P"	"P"	
RCM-4	"	"	"	Sph.	39	"P"	"P"	
UNION CARBIDE CORP.								
HC-14	(See Unocal's "Hydrocracking catalysts")							
HC-16	"							
HC-18	"							
HC-22	"							
HC-28								
HC-30	"							
UNOCAL CORP.								
HC-14	Flexibility for gasoline, naphtha, kerosene, jet fuel, or diesel production	Virgin cracked distillates, VGO	Gasoline, kerosene, jet fuel and/or diesel fuel	Cyl.	"P"	Contains molecular sieve	Nonnoble metals	Uniracking proess licensees
HC-16	Flexibility for kerosene, jet fuel, or diesel production	"	Kerosene, jet fuel, and/or diesel fuel	Cyl.	"P"	"	"	"
HC-18	Maximum production of LPG, gasoline, or naphtha	"	LPG, gasoline, and/or petrochemical naphtha	Cyl.	"P"	"	Noble metals	"
HC-22	Maximum production of diesel fuel or jet fuel	"	Diesel fuel and/or jet fuel	Cyl.	"P"	"	Nonnoble metals	"
HC-28	Maximum production of LPG, gasoline, and/or petrochemical naphtha	"	LPG, Gasoline, and/or petrochemical naphtha	Cyl.	"P"	"	Noble metal	"
HC-30	Selective hydrocracking for pour point reduction	Petroleum and shale oil fractions	Low pour point distillates, lube stocks, and/ or syncrudes	Cyl.	"P"	"	Nonnoble metal	"
HC-102	Maximum production of diesel fuel	Virgin and cracked distillates, VGO	Diesel fuel	Shaped Ext.	"P"	Amorphous	Nonnoble metal	"
PROCATALYSE								
HYL 544		Gas oil, vacuum gas oil	Gasoline, distillates	Cyl.		Al_2O_3 SiO_2	Ni/Mo	✓

Mild hydrocracking

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS								
KF-1001	Cobalt moly.	Convert VGO feeds	Distillate boiling range material	Cyl.	46	Alumina		
KF-1002	Nickel moly.	"	"	Cyl.	48	Alumina		
KF-1010/ 1011	Nickel moly.	"	"	Cyl.	48	Alumina		
AMERICAN CYANAMID CO.								
HCM-40	(See Unocal listing)						"P"	Unocal licensees
HCM-110	"						"P"	"
BASF AG								
M 8-80	Raffination and mild hydrocracking	HGO,VGO	Middle distillate	Cyc. extr.	Approx. 0.70 kg/l	Amorph. alumina-silicates	NiO MoO_3	BASF licensees
M 8-81	Mild hydrocracking, combination with M 8-14	"	"	"	Approx. 0.68 kg/l	"	"	"
BP								
MH 128	middle distillates	VGO	High selectivity to	Shaped ext.	45	"P"	"P"	✓
CATALYST & CHEMICALS INDUSTRIES CO., LTD.								
HT-D3	High middle distillate yield	VGO	Kerosene, diesel oil & desulfurized VGO	Cyl.	0.71 g/ml	Alumina		✓
CDS-D13	Middle distillate yield	VGO	Kerosene, diesel oil & disulfurized oil	Cyl.	0.78 g/cc	Alumina		

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
CHEVRON RESEARCH CO.								
ICR 106	High cracking activity, selective for mid-dist. production	VGO, CGO, LCO, AGO	Diesel, FCC feed, LSFO	Cyl.	63	"P"	"P"	Licensees Chevron Mild Isocracking Process
ICR 126	Longer life, higher conversion levels	"	Diesel, naphtha, FCC feed, LSFO	Cyl.	58	"P"	"P"	"
ICR 114	Lower cost	"	Diesel, FCC feed, LSFO	"P"	57	"P"	"P"	"
EXXON RESEARCH & ENGINEERING CO.								
RT-2 RT-228 RT-621	See also ER&E "Hydrorefining"							ER&E process license through certified vendor
RT-3 RTNX-1	High activity, regenerability	Virgin/cracked VGO's	FCC feed prep: naphtha and Mid-dist. prod'n	—	—	"	Cobalt, Nickel & Moly.	"
HALDOR TOPSQE								
TK-551	High stability	VGO range	Middle distillate plus treated VGO	Cyl.	46	Alumina	Ni,Mo	✓
TK-581	"	"	"	"	46	"	"	"
HARSHAW/FILTROL								
Filtrol HPC-50	High activity for nitrogen removal and polynuclear aromatics saturation, high sulfur removal activity	HVGO, VGO	FCC feed	Kloverleaf™ ext. (4-lobed)	51	Alumina	Nickel oxide (5.0%) Molybdic oxide (20.0%)	✓
KATALCO CORP.								
477	% of active metals	FCC feed, gas oil blends		Cyl.	45			
477S				Sph.	36	Alumina	Cobalt/Moly.	✓
479				Cyl.	51			
497	"	"		Katform	45	"	"	"
499S	"	"		"	51	"	"	"
482	Active metal	Sour gases and light hydrocarbon stocks		Cylinder	32	"	"	"
483	"	Refinery feedstocks		Cyl.	35	Alumina	Cobalt/Moly.	
484				Cyl.	42			
NM 502	"	FCC feed, gas oil blends, hydrocracker feedstock, cycle oils, coker distillates	FCC feed, hydrocracker feed	Cyl.	45	Alumina	Nickel/Moly.	
NM 502S				Sph.	36			
NM 504K				Cyl.	52			
NM 506				Cyl.	57			
592	% of active metals, shape	"	"	Katform	45	"	"	"
594		"	"	"	52	"	"	"
596		"	"	"	57	"	"	"
PROCATALYSE								
HTH 544	Good stability, high middle distillate selectivity	HVGO		Cyl.		Silica alumina	Nickel & Moly.	✓
SHELL CHEMICAL								
MHC-1	Combined conversion and desulphurization activity.	VGOs	Middle distillates plus treated VGO	Ext.	0.86 g/cc	Alumina	Ni/Mo/P	✓
MHC-200	Low pressure MHC catalyst	VGO's		Ext.	0.76	Alumina	Co/Mo	
UNOCAL CORP.								
HCM-40	High stability catalyst for mild hydrocracking	Virgin and cracked distillates and VGO	Distillates plus hydrotreated feedstock	Shaped ext.	"P"	"P"	"P"	Unocal Licensees
HCM-110	High stability catalyst for mild hydrocracking	"	"	Shaped ext.	"P"	"P"	"P"	Unocal Licensees
UNITED CATALYSTS INC.								
C20-7-02	Composition & physical properties	Lube oil & HVGO	Hydrogenation of olefins & cracked product	Exts.	44	Al_2O_3	Ni/Mo	✓
C20-7-02CDS	"	"	"	"	"	"	"	✓
C20-7-04	"	"	"	"	50	"	"	✓
C20-7-06CDS	"	"	"	Ext.	44	"	"	✓
UOP INC.								
DHC-2	Bifunctional catalyst, clean-clean-up and hydrogenation function, good cracking activity	VGO, CGO	Distillate production, desulfurization, lube base stocks	Sph	41	"P"	"P"	
MHC-10	Bifunctional catalyst, high hydrogenation and cracking activity	"	"	Cyl.	41	"P"	"P"	

OGJ international refining-catalyst compilation—continued

Hydrotreating/hydrogenation, saturation catalysts

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
AIR PRODUCTS & CHEMICALS INC.								
HR 836	Pretreat catalyst	Pyrolysis gasoline	Saturated hydrocarbons	Cyl.		Alumina	Co/Mo	Licensees of PYROTOL® process
AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS								
Active supports	Used to support catalyst bed and for feed distribution in top of reactor. Relatively low activity reduces coking and pressure drop and saturation of diolefins in cracked feedstocks.							
A-500	Nickel moly.			Cyl.	42	Alumina		
A-501	Cobalt moly.			Cyl.	42	Alumina		
NiMo 5B	Nickel moly.			Sph.		Alumina		
CoMo 5B	Cobalt moly.			Sph.		Alumina		
KFH-oil	Cobalt moly.	Resid		Cyl. ext.				
KFH-oil	Nickel moly.	Resid		″				
KFSC 1315	Shell Oil catalyst							
KF 1535/153	Nickel moly.	SR & cracked naphthas, distillates, VGO, LCO, lube oil & refined lube oil		Cyl.	48	Alumina		
KF 842	Nickel moly.	SR, cracked naphtha		Asym. Quadri-lobe (AQ)	51	Alumina		
KF 840	Nickel moly. high activity	SR & cracked naphthas, distillates, VGO.		AQ	47	ALumina		
KF 643/644	Nickel moly.	Hydrometallation		AQ	45	Alumina		
KF 330	Nickel moly.	High pressure lube oil saturation and diolefin saturation		Cyl.	52	Alumina		
KF 124 LD	Cobalt moly.	St. Run Naphtha		Cyl.	38	Alumina		
KF 124 HD	Cobalt moly.	Naphtha, kerosene, gas oil, VGO lube oil		Cyl.	48	Alumina		
KF 165	Cobalt moly.	SR & cracked naphthas, distillates, VGO, LCO, lube oil & refined lube oil		Cyl.	48	Alumina		
KF 640	Cobalt moly. high activity	Naphtha, kerosene, gasoil, vacuum gasoil		Asym. Quadrilobe (AQ)	41	Alumina		
KF 742	Cobalt moly. high activity	SR & cracked naphtha, distillates, and VGO; lube oil, rerefined lube oil & pyrolysis naphtha		″	46	Alumina		
KF 702	Cobalt moly. high activity	SR & cracked naphtha, distillates and VGO; LCO		Cyl. ext.		Alumina		
AMERICAN CYANAMID CO.								
HDS-2(1.6) HDS-2(3.2)	Different particle sizes	Naphthas through LGO		Cyl.	~ 36	Alumina	CoO/MoO_3	✓
HDS-3(1.6) HDS-3(3.2) TRILOBE® HDS-3(1.6) TRILOBE® HDS-3(3.2)	Different particle size & shapes	Naphthas through LGO		Cyl. or shaped ext.	44-47	Alumina	NiO/MoO_3	✓
HDS-9(1.6) HDS-9(3.2) TRILOBE®	Different particle size & shapes	Naphthas through heavy gas		Cyl. or shaped ext.	49-52	Alumina	NiO/MoO_3	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
HDS-9(1.6) TRILOBE® HDS-9(3.2)		oils						
TRILOBE® HDS-20(1.6) TRILOBE® HDS-20(3.2)	Different particle sizes	Naphthas through HGO		Shaped ext.	~ 46	Alumina	CoO/MoO$_3$	✓
TRILOBE® HDN-30(1.6) TRILOBE® HDN-30(3.2)	Different particle sizes	Naphthas through HGO		Shaped ext.	~ 52	Alumina	NiO/MoO$_3$	✓
TRILOBE® HDS-35(1.6) TRILOBE® HDS-35(3.2)	Different particle sizes	Naphthas through LGO		Shaped ext.	~ 46	Alumina	NiO/CoO/MoO$_3$	✓
AS-100	(See Unocal "Hydrotreating") listing							Licensees of Unocal's Unisar Process
TRILOBE® HDN-60(1.6) TRILOBE® HDN-60(3.2)	Different particle sizes	Naphthas through HGO		Shaped ext.	~ 53	Alumina	NiO/MoO$_3$	✓
RT-3	(See Exxon R&E "Hydrotreating Catalysts" listing)							Licensees of ER&E Gofining Process
DHT catalyst	(See Gulf Research Listing)							Gulf Licensees
IMP-DSD-3	(See Instituto Mexicano del Petroleo Listing)							Licensees of IMP
Trilobe® HDS-24 (1.6)	Different particle sizes	Naphthas thru HGO		Shaped ext.	~ 35	Alumina	CoO/MoO$_3$	✓
HDS-24 (3.2)	"	"		"	"	"	"	"
BASF AG								
M 8-14		LPG, natural gas, all SR fractions, and blends with cracked oils, pyrolysis gasoline	Steam reforming feed, catalytic reformer feed jet fuel, diesel feed for aromatic extraction plant	Cyl. ext.	Ca. 650 g/l	$\gamma-Al_2O_3$	Ca. CoO 4 wt% MoO$_3$ 15.5 wt%	✓
M 8-14 Star shaped	More active for heavy fractions.	HGO, VGO, SR, and blends, with cracked oils, paraffins, lube oils	Jet fuel, diesel gas oil, HC feedstocks, tech. white lube oil	Star shaped exts.	Ca. 600 g/l	$\gamma-Al_2O_3$	"	"
M 8-24 Cyl.		Blends of SR fractions with cracked oils	Catalytic reformer feed	Cyl. ext.	Ca. 700 g/l	$\gamma-Al_2O_3$	Ca. NiO 4 wt%, MoO$_3$ 16 wt%	"
M 8-24 Star shaped	More active for heavy fractions	Blend of HGO, or VGO with cracked oils, lube oil	Gas oil, FCC feed, lube oil	Star shaped exts.	Ca. 650 g/l	$\gamma-Al_2O_3$	"	"
M 8-25	Unsaturated compounds	Raffination and dearomatisation	Lube oil, paraffin wax	Cyl. extr.	Approx 0.85 kg/l	γ-Al$_2$O$_3$	NiO 5 wt%/ MoO$_3$ 19 wt%	✓
H 0-11		Selective hydrogenation of acetylene in ethylene	Ethylene	"	Approx. 0.46 kg/l	Silica	Pd	✓
H 0-12		Selective hydrogenation of acetylenes in C$_3$- and C$_4$-streams		Cyl. ext.	Approx. 1.1 kg/l	Alumina	Pd	✓
H 0-22		Selective hydrogenation of diolefines & unsaturated aromatics	Pyrolysis gasoline	Cyl. ext./sph.	0. 65 kg/ l/0.80 kg/l	Alumina	Palladium	✓
H 1-80		Hydrogenation of aromatics	Food grade white oil	Cyl. extr.	1.0 kg/l	Silicate carrier	Ni	BASF Licensees
EXXON RESEARCH & ENGINEERING CO.								
RT-3 RT-NX-1	High activity, excellent regenerability	Virgin/cracked VGO's and distillates	Feed prep. for cat. reforming & FCC; S and N removal, etc.	—	—	—	Cobalt, nickel & Molybdenum	ER&E process license through certified vendors.
ENGELHARD CORP.								
HPN®-1VB	Selectively hydrogenates trace butadiene and isomerizes butene-1 to butene-2	C$_3$-C$_5$ stream	Alkylation plant feedstock	"P"	"P"	"P"	"P"	HPN-IVB process licensees
GULF RESEARCH & DEVELOPMENT & CO.								
DHT-I	High activity hydrogenation	Distillates and LGO, HGO	High quality distillate fuels (incl. diesel)	Cyl.	60-70	Alumina	"P"	Gulf Dist. Hydrotreating Process licensee through Gulf approved vendor
DHT-II	Moderate activity hydrogenation	Naphtha, kerosene, distillates, cycle oils	Naphtha, kerosene, distillates	Cyl.	40-50	Alumina	"P"	Gulf Naphfining, Gulfining, & Cycle Oil Hydrogenation Process licensee through Gulf approved vendor

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
DHT-III	Improved version of DHT-II (desulfurization service)	Same as DHT-II plus HVGO	Naphtha, kerosene, diesel, distillates, FCCU feed	Cyl. Sph.	40-48 32-38	Alumina	"P"	Same as DHT-II plus HGO Gulfining
AR-I	Selective arsine removal catalyst	Light HC gas feedstocks for ethylene manufacture	Arsine-free feedstocks	Cylinder	34-35	Alumina	"P"	Lummus Arsine Removal Process licensee through Gulf approved vendor
HALDOR TOPSOE								
TK-230/231		Natural gas, refinery gases SR naphtha	Deep HDS for steam reforming and cat. reforming. HDS and olefin saturation of refinery gases	Cyl.	48	Al_2O_3	Co,Mo(230) Ni,Mo (231)	✓
TK-250/251	Ring-shaped	"	"	Ring	32	"	Co,Mo 250/ Ni,Mo 251	✓
TK-551		SR & cracked naphthas distillates to HAGO range	Deep HDS, HDN and aromatics saturation.	Ring cyl.	46	"	Ni,Mo	✓
TK-550	Lower selectivity for HDN and aromatics saturation than TK-551 and therefore lower H_2 consumption	"	Deep HDS	Ring Cyl.	46	"	Co,Mo	✓
HARSHAW/FILTROL								
Filtrol 107	High S removal combined with high HDM and low pressure drop. Resistance to coking.	Atm. & Vac. resid	FCC feed, fuel oil	Klover-™ leaf extrudate cyl.	38-39 (loading density)	Alumina	Nickel oxide 4%, Molybdic oxide 12%, Titanium oxide 8%	✓
Filtrol 102	same as 107, but smaller size							
Filtrol 106	High pressure demetalization combined with high S removal and low pressure drop. usually for front end applications (with GC-107 or GC-102 used in the back end)	"	"	Klover-™ leaf extrudate	37-38 (loading density)	Alumina	Cobalt oxide 1.5%, Nickel oxide 0.8%, Molybdic oxide 12%	✓
AVR-A, AVR-B, AVR-C, AVR-D	See Gulf R&D "Hydrorefining"							✓
Filtrol HPC-60	Highest activity for sulfur removal	High sulfur HGO, heating oil, naphtha	Gas oil, heating oil range, gasoline component	Klover-™ leaf extrudate	46	Alumina	Cobalt oxide 5.0%, molybdic oxide 16.0%	✓
Filtrol HPC-66	Slightly lower activity than HPC-60	"	"	Klover-™ leaf extrudate,	44	Alumina	Cobalt oxide 4.0%, molybdic oxide 15.0%	✓
Filtrol HPC-50	Highest activity for nitrogen and poly nuclear aromatics removal, high activity for S removal.	VGO, HVGO, LCO, CGO, coker distillates & naphtha, lube stocks	FCC feed, lube gasoline component, jet fuel	Klover-™ leaf extrudate,	51	Alumina	Nickel oxide, 5.0%, molybdic oxide 20.0%	✓
Filtrol HPC-40B	Same functions as HPC-50 but lower activity.	Preceeding & cracked naphtha, distillates	FCC feed, gasoline & diesel components	Klover-™ leaf extrudate,	47	Alumina	Nickel oxide 4.0%, molybdic oxide 15.0%	✓
CoMo-0402T		Desulfurization of hydrocarbons		Cyl. tablet	60	Silica Alumina	Cobalt moly.	✓
CoMo-0603T		Desulfurization of hydrocarbons		Cyl. tablet	64	Alumina	Cobalt moly.	✓
HT-400E	Highly active for desulfurization, denitrogenation	Heating oil & HVGO		Cyl. ext.	50	Alumina	Cobalt moly.	✓
HT-500E	Highly active for denitrogenation, desulfurization and polyaromatic saturation	Naphtha pretreating, AGO, LCO, HVGO	"	Cyl. ext.	50	Alumina	Nickel moly.	✓
INSTITUTO MEXICANO DEL PETROLERO								
IMP-DSD-3	High activity trilobe catalyst	Wide range of petroleum fractions	Naphtha for reforming, high diesel activity FCC feed	Cyl. Trilobe®	0.74 g/cc	γ-Al_2O_3	Mo, Ni, P	IMP Licensees
IMP-DSD-4	High activity sphere catalyst	"	"	Sph.	0.55 g/cc	γ-Al_2O_3	Mo, Ni	"

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
IMP-DSD-5	Good activity sphere catalyst for HDS	Gasolines to diesel	Naphtha for reforming good quality diesel	Sph.	0.55 g/cc	γ-Al_2O_3	Mo, Ni, P	"
IMP-DSD-1	Good activity sphere catalyst for hydrodesulfuration	"	"	Sp.h	0.86 g/cc	γ-Al_2O_3	Mo, Ni	"
KATALCO CORP.								
477* 477S* 479*	% of active metals, shape	SR naphtha through gas oil/resid blends		Cyl. Sph. Cyl.	46 36 52	Alumina	Cobalt/moly.	✓
497 499S	" "	" "		Katform "	45 51	" "	" "	" "
482	Active metal	Sour gases and light hydrocarbon		Cylinder	32	"	"	"
483 484	% of active metals	SR naphtha through gas/oil resid blends		Cyl. Cyl.	35 42	Alumina	Cobalt/moly.	✓
NM 502* NM 502S* NM 504K* NM 506*	% of active metals, shape	SR naphtha through gas oil/resid blends		Cyl. Sphere Cyl. Cyl.	46 36 56 58	Alumina	Nickel/moly.	✓
592 594 596	" " "	" " "		Katform Katform Katform	45 52 57	" " "	" " "	" " "
482 NM 503	Active metal	Sour gases, light hydrocarbon stocks		Cyl. Cyl.	32 32	Alumina	Cobalt/moly. Nickel/moly.	✓
NT 550 NT 550S	Shape	Cracked stocks/cycle oil, jet fuel, lubes		Cyl. Sph.	50 37	Alumina	Nickel/Tungsten	✓
DM 500	Demetallization	Heavy stocks/resids		Sph.	23	Alumina	Nickel/moly.	✓
* Company also lists as mild hydrocracking catalyst.								
PROCATALYSE								
LD 271	Selective hydrogenation of propylene rich cut from steam cracking, also butene-1 rich cut	Steam cracker propylene rich, butene-1 rich cut	Propylene, Butene 1	Sph.		Al_2O_3	Pd promoter	✓
LD 275	Selective hydrogenation of pyrolysis gasoline fractions	Pyrolysis gasoline	Gasoline	"		Al_2O_3	Pd promoter	✓
LD 277	Acetylene removal from Butadiene rich steam cracker cut	C_4 steam cracker cut	Butadiene rich C_4 cut	"		Al_2O_3	Pd promoter	✓
LD 2773	Selective hydrogenation of butadiene in butene rich cuts from FCC	FCC C_4 cut	C_4 cut	"		Al_2O_3	Pd promoter	✓
LD 277	MAPD removal from FCC propylene cuts	FCC C_3 cut	C_3 cut	"		Al_2O_3	Pd promoter	✓
Ni PS_2	Total hydrogenation of benzene into cyclohexane	Benzene	Cyclohexane	Powder		Ni	Ni	✓
LT 261	Selective hydrogenation of ethylene (acetylene removal)	Ethylene cut (vapor phase)	Ethylene	Sph.		Al_2O_3	Pd	
LD 145	Selective hydrogenation of pyrolysis gasoline and 180-400 °C. fraction	Pyrolysis gasoline	Gasoline	"		Al_2O_3	Ni/Mo	
LD 155	Selective hydrogenation of pyrolysis gasoline and 180-400 °C. fraction	Pyrolysis gasoline heavy gasoline	Gasoline, special fuel	"		Al_2O_3	Ni/W	
LD 241	Selective hydrogenation of pyrolysis gasoline	Pyrolysis gasoline	Sweet gasoline	"		Al_2O_3	Ni	
LD 265	Selective hydrogenation of pyrolysis propylene cut, butylene cut, and gasoline	Pyrolysis propylene cut, butylene cut, gasoline	Propylene, butylene, gasoline	"		Al_2O_3	Pd	
HC 102	Total hydrogenation	Benzene	Cyclohexane	liquid			Ni	✓
Cu 640	Hydrogenation	Aldehydes	Alcohols	Cyl.		SiO_2	Cu	✓
Ni 563	Hydrogenation	Aldehydes, unsaturated hydrocarbons	Alcohols, solvents	Pellets		SiO_2	Ni	✓
SHELL CHEMICAL								
S 214	Multi purpose hydrotreating	Naphtha to HVGOs		Exts.	0.66 kg/l	Alumina	Ni/Mo/P	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
S 324	High performance desulphurization, denitrogenation.	Coker naphtha and pyrolysis gasoline to HVGOs		*	0.86 kg/l	Alumina	Ni/Mo/P	√
S 324T	"	"		Trilobes	0.80 kg/l	"	"	
S 424	High activity desulfurization, denitrogenation and saturation	Pretreatment of cracker feed, first stage hydrocracking		Trilobes*	0.82	Alumina	Ni/Mo/P	√
S 327	Resistance to poisoning by metals.	Pretreatment of cracker feed and heavy oil fractions contaminated with metals.		*	0.80 kg/l	Alumina	Ni/Mo/P	√
S 514	Support Function-replaces inert ceramic material.	All HDT applications-preferentially cracked feedstocks.		Sph.	0.80 kg/l	Alumina	Ni/Mo	√
S 244	High efficiency desulphurization.	Naphtha and fuel oils.		Exts.	0.65 kg/l	Alumina	Co/Mo/P	√
S 344	Heavy duty desulphurization	Wide variety of stocks including HVGO		*	0.78 kg/l	Alumina	Co/Mo/P	√
S 344T	"	"		Trilobes*	0.73 kg/l	"	"	
S 434	High efficiency desulphurization	Naphtha and gas oil		Ext.	0.65	Alumina	Co/Mo	√
S 444	High activity desulphurization	VGO, LGO, HGO, Cracked gas oils		*	0.77	Alumina	Co/Mo	√
S 444T	"	"		Trilobes*	0.72 kg/l	"	"	
S 447	Deep desulfurization	VGO, residue, LGO, HGO		Trilobes*	0.71	Alumina	Co/Mo	√
S 544	Support function. Can replace all ceramic material.			Sph.	0.80 kg/l	Alumina	Co/Mo	√
S 127	Initial residue desulphurization	Heavy residues with moderate metal content.		Ext.	0.70 kg/l	Alumina	Ni/Mo	√
S 227	Tail end deep residue desulphurization	Heavy residues with moderate metal content.		*	0.70 kg/l	Alumina	Ni/Mo	√
S 147	Initial residue desulphurization	Heavy residues with moderate metal content.		*	0.70 kg/l	Alumina	Co/Mo	√
S 247	Tail end deep residue desulphurization	Heavy residues with moderate metal content.		*	0.70 kg/l	Alumina	Co/Mo	√
S 311	Hydrocracker tail end catalyst	Hydrocracked feed		Ext.	0.76	"	Ni/Mo	
S 614	Hydrogenation of aromatics	Kerosene and specialty oils		*	0.41 kg/l	Silica/ Alumina	Pt	√
S 204	Hydrogenation of di-olefins	Pyrolysis gasoline		*	0.72 kg/l	Alumina	Ni	√
S 504	Hydrogenation of di-olefins	Pyrolysis gasoline	Support balls, replaces inert ceramic material	Sph.	0.80 kg/l	Alumina	Ni	√
UNOCAL CORP.								
HC-B, HD-D, HC-F, HC-H, HC-K	(See "Hydrorefining catalysts")							
AS-100	Saturation of aromatics	Naphtha, kerosene, jet fuel	Low aromatics naphthas, high smoke point kerosene and jet fuel	Extruded Cyl.	"P"	"P"	Noble Metal	Unisar Process licensees
N-21, N-22, N-23, N-30, N-100	(See "Hydrorefining catalysts")							
UNITED CATALYSTS INC.								
C20-5-01		Coker naphtha, SR naphtha, kerosene, diesel	HDS, removal of metal contaminants such as As, Pb, Ni, V, improves color, odor, stability	Tablet or extrusion	50	Al_2O_3	Co/Mo	√
C20-6-01	Composition, physical properties	Light naphthas through heavy residues	HDS hydrogenation of olefins	Extrusion 1/8-in. or 1/16-in.	38	Al_2O_3	Co/Mo	√

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
C20-6-03	"	"	"	"	44	"	"	✓
C20-6-04	"	"	"	"	51	"	"	✓
C20-7-02	Composition physical properties	Cracked stocks and high olefin and nitrogen content feedstocks	HDS, HDN, hydrogenation of olefins, de-wax	"	44	"	Ni/Mo	✓
C20-7-03	"	"	"	"	38	"	"	✓
C20-7-04	Composition physical properties	Cracked stock, high olefin and nitrogen content feedstocks	HDS, HDN, hydrogenation of olefins, de-wax	Extrusion	50	Al_2O_3	Ni/Mo	✓
C20-6-04 CDS	High desulfurization activity	VGO, LGO, HGO		Ext.	37-43	Al_2O_3	CoMo	✓
C20-7-07 CDS	High desulfurization, denitrification activity	Pretreatment of FCC feed	FCC feed	Ext.	47-53	Al_2O_3	NiMo	✓
G-87	Total hydrogenation of Benzene to Cyclohexane	Benzene	Cyclohexane	Sph.	52-58		Ni	✓
G-98B	"	Bz with sulfur present	"	Tab	48-52	Silica	NiCuCo	✓
C46-7-03	High hydrogenation activity	Saturation of aromatics		Ext.	40-48	Silica	Ni	✓
C46-8-03	"	"		Ext.	40-48	Al_2O_3	Ni	✓
G-68A	Hydrogenation of C_5 dienes	Isoprene		Tab	32-38	Al_2O_3	Pd	✓
G-68C	Selective hydrogenation, DPG-diolefins	Pyrolysis gasoline	Gasoline	Sph.	42-48	Al_2O_3	Pd	✓
G-68D	Selectivity hydrogenates trace butadiene & isomerize B1 to B2	C_3 - C_5 stream	Alkylation feedstock	Tab	64-69	Al_2O_3	Pd	✓
C38-1	Selective hydrogenation, trace butadiene with isomerization	C_3 - C_5 stream with sulfur present	"	Ext.	52-58	Al_2O_3	Ni	✓
C20-7-06CDS	"	"	"	Extrusion	44	"	Ni/Mo	✓
UOP INC.								
S-12	High desulfurization and denitrifaction activity.	Naphtha through VGO, cracked stocks, high severity operation	Desulfurization, denitrification	Cyl.	49	Alumina	Cobalt Molybdenum	
S-16	Moderate dentrification and desulfurization activity.	Naphtha through VGO, cracked Stocks. Moderate to high Severity Operation	"	Cyl.	50	Alumina	Nickel, Molybdenum	
S-9	Moderate desulfurization and dentrification activity.	Naphtha through AGO. Moderate severity operation.	"	Sph.	39	Alumina	Cobalt, Molybednum	
PF-4	Selective hydrogenation catalyst	Alphmethylstyrene in Cumene. Diolefin Saturation	Cumene, pyrolysis Gasoline	Sph.	32	Alumina	Palladium	
H-3	High hydrogenation activity, sulfur tolerant	Saturation of aromatics (usually benzene)	High-purity cycloparaffins (usually cyclohex ane)	Sph. Sphere	32	Alumina	Platinum	
H-4	High hydrogenation activity	" plus selective diolefin sat., methanation	"plus upgrade alky unit feed"		Sph.	39	Alumina	Nickel
H-8	High hydrogenation activity	Saturation of aromatics in distillate fuels. Saturation of residual aromatics in n-Paraffin streams	Improved burning or ignition qualities. High purity N-Paraffins	Sph.	32	Alumina	Platinum	

Hydrorefining

AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS	
HCK	(See Unocal "Hydrorefining" listing)
RT-2, RT-3, RT-621, RT-228, RT-NX7	See ER&R "Hydrorefining" listing

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
AMERICAN CYANAMID CO.								
HC-B, HC-D, TRILOBE® HC-F, TRILOBE® HC-H	(See Unocal "Hydrorefining catalysts" listing)			Cyl. or shaped extrudate				Licensees of Unocal's Unicracking Process.
TRILOBE® RF-11, TRILOBE® RF-25	(See Unocal "Hydrorefining catalysts" listing)			Shaped extrudate				Licensees of Unocal's Unicracking-HDS Process.
RT-2	(See Exxon R&E "Hydrorefining catalysts" listing)							Licensees of Exxon's Residfining Process.
RT-3	(See Exxon R&E Listing)							Licensees of Exxon's Go-fining process
CSM-471		Resid hydrotreating		Shaped ext.	"P"	"P"	"P"	Licensees of Campagnie Francaise de Raffinage
HDS-1442A HDS-1442B	Different particle sizes	Resid or VGO hydrotreating		Cyl.	~ 34	Alumina	CoO/MoO_3	✓
HDS-1443-A HDS-1443-B	Different particle sizes	Resid or VGO hydrotreating		Cyl.	~ 36	Alumina	NiO, MoO_3	✓
HDS-9(1.6) HDS-9(3.2) TRILOBE® HDS-9(1.6) TRILOBE® HDS-9(3.2)	Different particle sizes and shapes	HGO/cat. feed hydrotreating	Fuel oil/FCC feed	Cyl. or shaped extrudate	49-52	Alumina	NiO/MoO_3	✓
TRILOBE® HDS-20(1.6) TRILOBE® HDS-20(3.2)	Different particle sizes	"	Fuel oil/FCCU feed	Shaped extrudate	~ 46	Alumina	CoO/MoO_3	✓
TRILOBE® HDN-30(1.6) TRILOBE® HDN-30(3.2)	"	"	Fuel oil/FCCU feed	Shaped extrudate	~ 52	Alumina	NiO/MoO_3	✓
A/VRA-F	(See Gulf "Hydrorefining listing")							Licensees Gulf HDS
TRILOBE® HDN-60(1.6) HDN-60(3.2)	Different particle sizes	HGO/cat. feed hydrotreating	Fuel oil/FCCU feed	Shaped extrudate	~ 53	Alumina	NiO/MoO_3	✓
LF-I, LHT-II, LHT-I, LHT-II, LHT-III	(See Gulf R&D "Hydrorefining listing")							Gulf R&D licensees
N-21, N-22, N-23, N-24, N-30	(See Unocal "Hydrorefining" listing)							Licensees of Unocal Unionfining process
BASF AG								
M 8-21		Raw lube oil feedstocks	lube oil, white oil	Cyl. ext.	Ca. 720 g/l	Alumina	Ni/Mo	
CATALYST & CHEMICALS INDUSTRIES CO., LTD.								
CDS-R2	High HDS activity at low reaction temperature.	Atm. & vac. resid	Desulfurized oil	Cyl.	0.68 g/ml	Alumina	—	✓
CDS-R9	High HDS & demetalization activity	Atm. & vac. resid	Desulfurized oil	Cyl.	0.66 g/ml	Alumina	—	✓
CDS-DM-1	High dematalization activity	"	Demetalized oil	Cyl.	0.58 g/ml	"	—	✓
CDS-DM5	High demetalization activity with desulfurization ability	"	"	"	0.62 g/ml	"		
CDS-D5	High HDS activity	Naphtha & kerosene	Desulfurized naphtha & kerosene	Cyl.	0.68 g/ml	—	—	✓
CDS-D9	High HDS activity	Naphtha, kerosene, naphtha, gas oil	Desulfurized Kerosene, gas oil	"	0.72	Alumina		
CDS-D11	High HDS activity	Kerosene, diesel & VGO	Desulfurized, kerosene, diesel & VGO	Cyl.	0.73 g/ml	—	—	✓
CDS-D13	Superior high HDS activity	"	"	"	0.78	"		
CDS-DN1	High HDS and HDN activity	Naphtha	Desulfurized Naphtha	"	0.77	"		
CDS-DR1	High HDS activity	20-30% Atm. resid and 80-70% VGO (mixture)	FCC feed, desulfurized oil	"	0.70	"		
CHEVRON RESEARCH CO.								
ICR 112	High HDS activity, low H_2 consumption	VGO, CGO	LSFO, FCC feed	Cyl	53	"P"	"P"	Licensees Chevron Hydrotreating Process

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
ICR 114	High HDN activity	VGO, CGO	FCC feed	"P"	57	"P"	"P"	"
ICR 105	Designed for resid hydrotreating	DAO, topped crudes, atm. resids, vac. resids	LSFO, FCC feed, coker feed	Cyl.	49	"P"	"P"	"
ICR 121	Resid feeds	"	"	"P"	43	"P"	"P"	"
ICR 122	Resid HDM	"	LSFO, FCC feed, resid desulfurization feed, coker feed	"P"	30	"P"	"P"	"
ICR 124	Resid HDM	"	"	"P"	30	"P"	"P"	"
EXXON RESEARCH & ENGINEERING CO.								
RT-2 RT-228 RT-621	Contaminant tolerant catalyst for resid processing	Atmos. resids, vac. resids	Feed prep for FCC and coking, LSFO & Lt. distillates	—	—	Tailored pore size supports	Co/Mo. & Ni/Mo	ER&E process licensee through certified vendors.
RT-3, RT-NX-1	High activity, Regenerability	Virgin/cracked VGO's and distillates	Feed prep. for cat. reforming & FCC, S and N removal, etc.	—	—	—	Co/Ni/Mo	"
GULF RESEARCH & DEVELOPMENT CO.								
A/VR-A	High metals resistance Resid HDS catalyst.	Up to 75% desulfurization of atm. & vac. residuals	0.5-1.0% sulfur content HFO	Cyl.	32-40	Alumina	"P"	Gulf resid HDS Process licensee through Gulf qualified vendor.
A/VR-B	Reduced ΔP-comparable in activity to A/VR-A	"	"	Multi-lobe shape	30-38	Alumina	"P"	"
A/VR-C	High coke deactivation resistant Resid HDS catalyst. Good metals retention.	75-93% desulfurization of atm. & vac. resids.	0.2-0.6% sulfur content HFO, resid FCC feedstock preparation	Multi-lobe shape	33-41	Alumina	"P"	"
A/VR-D	Reduced ΔP-comparable in act. to A/VR-C	"	"	Multi-lobe shape	33-41	Alumina	"P"	"
A/VR-E	High severity desulf. service Resid HDS catalyst (regenerable)	>93% desulfurization of atm. & vac. residuals	0.05-0.2% sulfur content HFO	Cyl.	33-42	Alumina	"P"	"
A/VR-F	Reduced ΔP-comparable in activity to A/VR-E	"	"	Multi-lobe shape	31-40	Alumina	"P"	"
A/VR-G	Alternate metals formulation of A/VR-A.	Up to 75% desulfurization of atm. & vac. residuals.	0.5-1.0% sulfur content resid fuel oils	Cyl.	34-40	Alumina	"P"	"
A/VR-H	Reduced ΔP-comparable in activity to A/VR-G	"	"	Multi-lobe shape	32-38	Alumina	"P"	"
A/VR-I	Superior metals resistance, comparable HDS activity improvement to A/VR-A,B.	High metals content atm. & vac. resids	Upfront demet/HDS catalyst for high demetallization services.	Multi-lobe shape	30-37	Alumina	"P"	"
LF-I	1st generation lube finishing catalyst	Conventional refined or virgin lube feedstocks	Automotive & industrial lube and base oils	Cyl.	40-50	Alumina	"P"	Gulf Gulfinishing Process licensee through Gulf approved vendor
LF-II	High activity, hydrogenation, selective hydrocracking	"	"	Cyl., sphere	40-48 (c) 32-38 (s)	Alumina	"P"	"
LHT-I	High activity hydrogenation, selective hydrocracking	Poor quality lube feedstocks	"	Cyl.	50-55	Silica/alumina	"P"	Gulf Lube Hydrotreating Process licensee through Gulf approved vendor
LHT-II	Higher activity.	"	"	Cyl.	50-60	Silica/alumina	"P"	"
LHT-III	Selective hydrogenation, saturation catalyst	Semi-refined lube or specialty oil product feedstocks	Lubricants, industrial oils & specialty products	Cyl.	60-70	Alumina	"P"	Gulf Lube Hydrotreating & Specialty Oil Hydrogenation Process licensees
HALDOR TOPSOE								
TK-550	Smaller pore catalyst for lighter feeds	AGO, VGO	HDS	Ring/Cyl.	37/46	Al_2O_3	Co, Mo	✓
TK-551	"	VGO, FCC feedstocks, CGO	HDS, HDN, PNA removal	Ring, Cyl.	37 46	"	Ni/Mo	✓
TK-581	Larger pore catalyst for heavier feeds	"	"	Ring, cyl.	37 46	"	Ni/Mo	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
TK-709	Low HDS activity, high HDM selectivity, high metals capacity	Atm resid, vac. resid, DAO	Front end catalyst in HDS, HDM service	Ring, cyl.	25 33	Al_2O_3	Mo	✓
TK-710/711	Slightly higher HDS activity than TK-709, high HDM selectivity, high metals capacity	"	"	Ring, cyl.	31 40	" "	Co,Mo (710) Ni, Mo (711)	✓
TK-750/751	Medium HDS activity, HDM selectivity and tolerance for metals deposition	"	Intermediate catalyst in HDS, HDM service	Ring, cyl.	31 40	" "	Co, Mo (750) Ni, Mo (751)	✓
TK-770/771	High HDS activity, low HDM selectivity and limited tolerance for metals deposition.	"	Final catalyst in HDS, HDM service	Cyl.	45	" "	Co, Mo (770) Ni, Mo (771)	✓
INSTITUTO MEXICANO DEL PETROLEO								
IMP-HDW-10	Zeolitic based catalyst used for dewaxing lube oil cuts	Wide range of lube oils	Dewaxed lubestock	Cyl.	0.80 g/cc	Zeolite Al_2O_3	Pt/Zeolite	IMP licensees
KATALCO CORP.								
477, 477S, 479, 497, 499	(See also Katalco Corp. "Mild hydrocracking")							
483, 484	"							
502, 504, 506, 592, 594, 596	"							
UNOCAL CORP.								
N-30	High activity, desulfurization	Virgin & cracked distillates, naphthas, & VGOs	Desulfurized products	Shaped extrudate	"P"	"P"	Co, Mo	Unionfining Process licensees
N-100	"	"	"	Extruded Cyl.	"P"	"P"	Co, Mo	"
N-23	"	"	"	Extruded Cyl.	"P"	"P"	Co, Mo	"
N-22	Desulfurization & denitrogenation	"	Low sulfur, low nitrogen products	Extruded Cyl.	"P"	"P"	Ni, Mo	"
N-21	"	"	"	Extruded Cyl.	"P"	"P"	Ni, Mo	"
HC-H	Desulfurization and Denitrogenation	Virgin & cracked distillates & VGOs	Hydrocracker & cat cracker feeds	Shaped extrudate	"P"	"P"	Ni, Mo	Unicracking and VGO Unionfining process licensees
HC-K	"	"	"	Shaped extrudate	"P"	"P"	Ni, Mo	"
HC-F	"	"	Distillate products, hydrocracker and cat cracker feedstocks	Shaped extrudate	"P"	"P"	Ni, Mo	"
HC-D	"	"	"	Extruded Cyl.	"P"	"P"	Ni, Mo	"
HC-B	"	"	"	Extruded Cyl.	"P"	"P"	Ni, Mo	"
RF-11	Desulfurization catalyst	Atm. residua, whole crudes	Fuel oil, cat cracking, coker feed	Shaped extrudate	"P"	"P"	"P"	Unicracking/HDS Process licensees
RF-25	High activity bifunctional catalyst for demetallization	"	"	"	"P"	"P"	"P"	"
RF-100	Desulfurization catalyst	"	"	"	"P"	"P"	"P"	"
RF-200	High activity bifunctional catalyst for demetallization	"	"	"	"P"	"P"	"P"	"
RF-220	"	"	"	"	"P"	"P"	"P"	"
UOP INC.								
RCD-5	Metals tolerance and HDS, activity	Atm. or vac. residua	LSFO, feedstock for cracking units & cokers	Sph.	41	Alumina	Co/Mo	
RCD-5A	High activity for HDS, moderate metals tolerance	"	"	Sph.	46	Alumina	Co/Mo	
RCD-7	High activity for Sulfur and Con. Carbon Removal	Dematallized oil, deasphalted residua	LSFO & Feed for cracking units	Cyl.	53	Alumina	Co/Mo	
RCD-8	High metals tolerance, high demetallization activity, moderate HDS activity	Atm. or vac. residua, & deasphalted residua	LSFO & feeds for cracking units & cokers	Cyl.	36	"P"	"P"	
PROCATALYSE								
HR 306	HDS, HDN	Naphtha through VGO		Cyl.		Al_2O_3	Co/Mo	✓
HT 308	HDT	Residues		"	0.67 g/cc	"	Co Mo	✓
HR 346	HDS, HDN, hydrogenation	"		Cyl.		Al_2O_3	Ni/Mo	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
HR 348	HDS, HDN, hydrogenation of aromatics	Naphtha through VGO	Desulfurized nitrogen free, hydrogenated product, example - FCC feed preparation	Cyl.	0.77 g/cc	Al_2O_3	Ni Mo	✓
HR 354	"	"		Cyl.		Al_2O_3	W/Ni	✓
HMC 841	HDT, HDM	GO, VGO, Atm. resid./vac resid.		sph.		Al_2O_3	Ni MO	✓
HMC 849	HDM	GO, VGO, atm. resid./vac. resid.		Sph.		Al_2O_3	Ni Mo	✓
HMC 845	HDT, HDM	GO, VGO, atm. resid./vac resid.		Sph.		Al_2O_3	Ni Mo	✓
Actispheres 923	Catalyst protection and support	Naphtha through atm. resid		Sph.		Al_2O_3	Ni/Co/Mo	✓

Polymerization

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
INSTITUTO MEXICANO DEL PETROLERO								
IMP-TPC-1	High selective extrudate catalyst	Propylene	Propylene tetramer, high octane gasoline	Cyl.	0.88 g/cc	Kieselgurgh	H_3PO_4	IMP licensees
UNITED CATALYSTS INC.								
C84-1-01 & C-84-02-04	Particle size	Propylene, benzene Propylene &/or butenes Propylene	Cumene Polygasoline Higher olefins	Sph.	55	Diatomaceous earth	Phosphoric acid	✓
C84-3-01 & C84-3-02	Form, particle size	"	"	Extrusion	"	"	"	✓
UOP INC.								
SPA-1	High activity & selectivity; large size for chamber reactor	Propylene, butenes, pentenes, benzene, toluene	Petrochemicals, gasoline, tetramer, cumene, cymene	Cyl.	58	Silica	Phosphoric acid	Contact UOP
SPA-2	Small size for tubular reactor	"	"	Cyl.	58	Silica	Phosphoric acid	Contact UOP
SPA-4	High temp. aromatic operations	Ethylene, benzene	Ethylbenzene	Cyl.	61	Silica	Phosphoric acid	Contact UOP

Sulfur (elemental) recovery

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
ALCOA								
S-100 1/4-in	Lower pressure drop	Refinery heavy hydrocarbons in Claus feedstock	Withstands coking and ammonia. All converters and subdewpoint tail-gas processes.	Sph.	46	—	None	✓
S-100 3/16-in.	Higher activity	Refinery or natural gas	All converters and subdewpoint tail-gas processes	"	46	—	None	✓
S-100 5/16-in.	Extremely low pressure drop		Withstands extreme coking and ammonia. All converters but primarily first converter	Sph	46		None	
SRU 1/2-in.	Active bed support	All Claus plants	All Claus plants	"	50	—	None	✓
SRU 3/8-in.	"	"	All Claus plants	"	50	—	None	✓
SP-100 1/4-in.	Promoted, lower pressure drop	COS and CS_2 conversion	COS and CS_2 conversion	"	48	S-100 1/4-in.	"P"	✓
SP-100 3/16-in.	Promoted	COS and CS_2 conversion	COS and CS_2 conversion	"	48	S-100 3/16-in.	"P"	✓
ARI TECHNOLOGIES								
ARI-310	Active ingredient in chelated aqueous solution	Refinery gas, sour water stripper gas, amine tail gas, natural gas	Elemental sulfur	Liquid	74.8	None	Iron	Lo-Cat process licensees
CATALYST & CHEMICALS INDUSTRIES CO. LTD.								
CSR-2	High Claus activity	Claus reaction feed gas.	Sulfur	Sph.	0.84 g/ml	Alumina	—	✓
CSR-3	High hydrolysis of organic sulfide	"	"	"	0.87 g/ml			
CSR-7	High prevention of sulfation	"	Sulfur	Sph.	0.80 g/ml	Alumina	—	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
ENGELHARD CORP.								
SRC 2-4	High Claus activity	Gas containing 2:1 H_2S/SO_2	Purified gas and sulfur	Granules	53	Alumina	Alumina/titania/iron oxide	✓
SRC-4-8	Higher than SRC 2-4 activity	Gas containing 2:1 H_2S/SO_2	"	Granules	55	Alumina	"	✓
LPD 5-6	Modest activity. Bed support or topping	Gas containing 2:1 H_2S/SO_2	"	Extrudate	52	Alumina	"	✓
LPD 5-8	Modest activity, bed support only	"	"	Extrudate	52	Alumina	"	✓
KAISER CHEMICALS								
S-201 3 x 6, 1/2 x 1/4	Standard high porosity alumina Claus	H_2S and SO_2 conversion. Moderate COS and CS_2 conversion.	Sulfur production	Sph.	45	Activated alumina	Activated alumina	✓
S-501 3 x 6, 1/2 x 1/4	Promoted alumina Claus sulfur recovery catalyst. Sulfation resistant.	High activity catalyst for improved COS and CS_2 conversion.	"	Sph.	52	Activated alumina	"P"	✓
S-701	" plus thermal stability	Very high CS_2 and COS conversion and H_2S conversion.	"	Klover-leaf* extrudate	52	"P"	"P"	✓
RHONE POULENC								
CR 4-6	High pore volume alumina	H_2S	Sulfur	Sph.	0.67 g/ml	Alumina		✓
DR 5-10	First generation Claus catalyst.	"	"	"	0.75 g/ml	Alumina		✓
AM 4-6	Catalysts sulfation protection	"	"	"	0.75 g/ml	Alumina	Fe	✓
CRS 21	High COS & CS_2 conversion	"	"	"	0.71 g/ml	Alumina	TiO_2	✓
CRS 31	High COS and CS_2 conversion. Unsulfatable catalyst.	"	"	Ext. cyl	0.95 g/ml	Titanium oxide	TiO_2	✓
CT 739	Catalytic incineration	H_2S & SO_2	SO_2	Sph.	0.60 g/ml	Silica	Fe	✓
SHELL CHEMICAL								
S 949	High activity Claus catalyst with high COS and CS_2 hydrolysis		Sulfur	Sph.	0.53 g/ml	Silica	—	✓
UNOCAL CORP.								
Selectox-32	Solid catalyst for oxidation of H_2S to sulfur	Acid gas from refineries, natural gas plants, or waste treatment plants.	Sulfur, no SO_3	Cyl. Ext.	"P"	"P"	Non-noble metals	Selectox process licensees
Selectox-33	"	"		"		"	"	"

Steam hydrocarbon reforming catalysts

BASF AG								
M 8-12	Hydrogenation of organic sulfur compounds	Natural & refinery gas, LPG, & lt naphtha	Steam reformer feedstock	Extrudates	0.72 kg/l	Alumina	Co/Mo	✓
M 8-21	"	" (with high CO_2 content)	"	"	0.72 kg/l	Alumina	Ni/Mo	✓
R 5-10	Removal of H_2S	Sulfur containing gases	"	"	1/4 kg/l	—	Zinc oxide	✓
G 1-25	Steam reforming (gasification)	Natural & refinery gas	Process gas for CO-shift conversion	Rings	1.1-1.25 kg/l	Alumina	Ni	✓
G 1-25 S	"	"	"	Rings	0.9 kg/l	Alumina (high thermostability)	Ni	✓
G 1-50	"	LPG/naphtha	"	Rings	1.1 kg/l	—	Nickel alkalized on a special carrier	✓
G 1-80	Autothermal steam reforming	Naphtha/LPG	Process gas for tubular reformer	Tablets	"P"	"P"	Nickel	Licensee: BASF/LURGI Richgas-Process
K 6-10	High temp. shift conversion (HTS)	Process gas ex steam reforming/partial oxidation	Process gas for H_2 production	Tablets	1.0 kg/l	—	Iron oxide/chromium oxide	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
K 8-11	Shift conversion of sulfur containing gases	Process gas ex partial oxidation	"	Extrudates	"P"	"P"	Co Mo	✓
K 3-110	Low temp. shift conversion (LTS)	Process gas ex HTS	"	Tablets	"P"	Zno Al_2O_3	Cu	✓
R 1-10	Methanation	Methanation of CO_2 & CO	H_2	Tablets	0.9 kg/l	Alumina	Nickel	✓
DYCAT INTERNATIONAL								
Dycat 873	High activity steam reforming catalyst	Natural gas LPG, refinery off-gas, to light naphtha		Rings	68-70	Alpha alumina	Ni, La	✓
Dycat 873F	"	"		Enhanced surface area, fluted ring	64-66	"	"	"
Dycat 804	High temperature methanation	Process gas		Rings, cylinders	54-56	"	"	"
Dycat 704	Methanation	"		Cylinders, spheres	58-62	Refractory	Ni	"
HALDER TOPSOE								
RKS-1	Medium active steam reforming catalyst	Lt. to hvy. NG and ref. off gas	H_2, CO, CO_2	Rings	62-65	$MgAl_2O_4$	Ni	✓
R-67	High active steam reforming catalyst	C_1-C_4 hycarbon, ref offgas	"	"	65-68	"	"	✓
R-67-7H	"	"	"	Cyl. penetrated by 7 holes	53-56	"	"	"
RKNR	"	Methane, LPG, naphtha, reforming off-gas	"	Rings	57-60	MgO, Al_2O_3	"	Licensees
HTZ-3	Fine desulphurization of steam reforming feed stocks	Methane, LPG, naphtha ref offgas	S free hydrocarbon	Extrusion	78	—	ZnO	✓
SK-12	High temperature CO conversion	Steam reforming effluent	Gas with 2-3% CO	Cyl	65	—	Oxides of iron & chromium	✓
LSK	Low temp. CO conversion, regenerable, Cl_2 resistant	HT-shift effluent	Gas with 0.1-0.3% CO	Cyl	66	—	Oxides of copper-zinc & chromium	✓
LK-801	Low temperature CO conversion, sulfur resistant	HT-shift effluent	Gas with 0.1-0.3% CO	Cyl	67	—	Oxides of copper, zinc & aluminum	✓
PK-5	Methanation	H_2 with up to 2% ($CO+CO_2$)	H_2 without O_2 containing contaminants	Ext. rings	39	Alumina	Nickel	✓
KATALCO CORP.								
23-1	Steam reforming	Natural gas/refinery gas		Ring	66/75	Alumina	Ni	✓
23-3	"	"		Ring	66/75	Alumina	Ni	✓
25-3	"	Hvy natural gas		Ring	66	Ca/Aluminate	Ni Potash	✓
46-9	"	" & LPGs		Ring	66	Ca/Aluminate	Ni Potash	✓
46-1	"	Naphtha		Ring	72		Ni Potash	✓
46-4	"	Naphtha		Ring	62		Ni	✓
71-1	High temp. shift	Reformer product gas		Cyl.	77	None	Iron/Chrome oxides	✓
52-1	Low temp. shift	HT shift product gas		Cyl.	62	None	Copper/Zinc/Alumina	✓
52-2	"	"		Cyl.	62	None	"	✓
11-3	Methanation	CO_2 removal plant gas		Cyl	70	Ca/Aluminate	Ni	✓
11-4	"	as above		Cyl	75	Ca/Aluminate	Ni	✓
59-3	Chloride removal	Any gas stream		Sphere	55	Alumina	Activated alumina	✓
32-4	Sulfur removal	"		"	77	None	Zinc oxide	✓
UNITED CATALYSTS INC.								
C11-2 and C11-2S	Steam hydrocarbon reforming	Natural gas through propane feeds	H_2, 65-72%	Raschig rings	50-55°	Calcium Aluminate	Ni	✓
C11-9-01, 02, 03, 04, 06	Composition differs	"	"	Raschig rings	70-95°	Refractory Alumina	Ni	✓
C11-9-09 HGS	"	"	"	High geometric surface area 7-spoke short "wheels"	70	"	Ni	✓
G90A & B, & C	"	"	"	Raschig rings	50-60°	"	Ni	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
G56A, B, H	"	"	"	Raschig rings	55-60	Calcium Aluminate	Ni	✓
C11-9-061	Composition differs	Butane through naphtha feeds	H_2, 65-72%	Raschig rings	80-85*	Refractory Alumina	Ni	✓
C11-9-062	"	"	"	Raschig or HGSA	80-85 70 (HGS)	"	Ni	✓
C11-N/C11-NK (split loading)	"	Butane through naphtha	"	Raschig ring	67	Refractory	Ni	✓
* Bulk density depends on size of rings and Ni content.								
C7-2 C7-4	Desulfurization, differ in metal content	NG steam reformer feeds	Sulfur free streams	Ext.	70 80	Binder	ZnO	✓
G-72D	"	"	"	"	70		"	✓
G-1	Conversion of S compounds to H_2S absorption of H_2S	NG streams	"	Tablets	"P"	"P"	"P"	✓
C12-3-05	High temperature shift conversion	Process gas ex reformers	CO free gas	Tablets	65	—	Fe Cr	✓
G3	"	"	"	"	70	—	Fe Cr	✓
C18 HC	Low temperature shift conversion	Process gas	"	Tablets	80-85	—	Cu	✓
C18-HCS	Low temperature shift conversion	"	"	"	70-80		Cu	✓
G66A	"	"	"	Tablets	80	—	Cu (available pre-reduced and stabilized)	✓
G66B	"	"	"	Tablets	90/85	—	"	✓
C13-3 C13-4 C13-5	Methanation, (differ in form & metal content)	Process gas	Hydrogen without CO and CO_2	Tab. Sph.	65 55 60	Refractory	Ni	✓
C25-2-02	Co/H_2O shift H_2S containing gas	", partial oxidation		ext. or tabs	40-47	Al_2O_3	Co Moly	
G65	"	"	"	Tab.	Tablets 65(T)	"	"	✓
G65RS	(withstands elevated temperatures)			Ext.	58(ex) 60(T)		(available pre-reduced and stabilized)	
G87 G87RS	Methanation	"	"	Ext. Sph.	60 (ex) 55 (S)	"	"	✓
PROCATALYSE								
MT 25	CO Methanation		Pure H_2	Spheres		Alumina	Ni	✓

Sweetening catalysts

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
INSTITUTO MEXICANA DEL PETROLEO								
IMP OM-1	Sweetening in homogenous phase	LPG, gasoline		Powder	—	—	Cobalt	IMP licensees
IMP-OM-2	Sweetening in heterogenous phase	Gasoline, turbofuel kerosene		Powder	—	—	Cobalt	"
UOP INC.								
MEROX FB®	Active agent dispersed in water. For MEROX® fixed-bed sweetening process.	Lt. nap. to diesel fractions		Liquid slurry		—	"P"	MEROX Process Licensees
MEROX WS®	Active agent dissolved in water. For MEROX® liquid-liquid sweetening process.	C_1 through LSR & thermal gasolines		Liquid solution		—	"P"	MEROX Process licensees
MEROX No. 10®	Active agent supported on activated carbon base.	Lt. nap. through diesel fractions		Granular		Activated carbon	"P"	MEROX process licensees
MEROX NO. 8®	"	" Light naphthas through diesel fractions		Granular		Activated carbon	"P"	MEROX process licensees
ARI TECHNOLOGIES								
ARI-100, ARI 100 W.S.	Powder (WS-in water soluble bags)	LPG and gasoline	Merox® Process Merical® Process, Liquid/liquid contactor	Powder		None	"P"	✓
ARI-100L		"	"	Liquid suspension		None	"P"	✓
ARI-100XSL		"	"	Liquid		None	"P"	✓
ARI-120		LPG, gasoline, kero. jet fuel	Merox® Process, fixed bed reactor	Powder		None		✓

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
ARI-120L		"	"	Liquid slurry		None		✓

Claus Unit tail gas treatment catalysts

AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS								
KF-124 LD	Co/Mo			Cyl.	38	Alumina		
KF-124 HD	Co/Mo			Cyl.	48	Alumina		
KF 165	Co/Mo			Cyl.	48	Alumina		
ALCOA								
S-100 1/8-in.	Subdewpoint Claus tail-gas processes			Sph.	46	—	None	✓
AMERICAN CYANAMID CO.								
N-25, N-39	(See Unocal "Claus Unit tail gas listing")							
HDS-2		Tail gas		Cyl.	– 36	Alumina	CoO/MoO_3	✓
Selectox-33	(See Unocal listing)						licensees	Unocal
ARI TECHNOLOGIES								
ARI-310	Active ingredient in chelated aqueous solution	Claus tail gas, amine acid gas	Elemental sulfur	Liquid	74.8	None	Iron	Lo-Cat® process licensees
KAISER CHEMICALS								
S-201 3×6 5×8	Standard high porosity alumina catalyst.	Sub-dewpoint Claus tail gas processes (i.e., CBA, Sulfreen, MCRC)		Sph.	45	Activated alumina	Activated alumina	✓
S-701	Promoted Sulfur recovery catalyst	High CS_2 and COS conversion. For use in selected TGCU processes (i.e., Sulften)		Klover-leaf® ext.	52	"P"	"P"	✓
PROCATALYSE								
HR 103	Total hydrogenation of S compounds into H_2S	Claus tail gas	Sph	0.75 g/cc	Al_2O_3	Co Mo	✓	
RHONE POULENC								
A 2.5	Catalysts for Sulfreen Process	Claus Plant effluent		Sph.	0.77 g/cc	Alumina	—	✓
CRS 31	Oxidation of H_2S into Sulfur	"		Ext.	0.95 g/cc	Titanium oxide		✓
AM 2.5	Catalyst protection (Sulfreen units)	"		Sph.	0.82 g/cc	Alumina	Fe	✓
SHELL CHEMICAL								
S 099	Incineration of Claus and/or SCOT tailgas	Claus and SCOT unit tailgas		Sph.	0.78 g/cc	Alumina	—	✓
S 599	Support function, replaces inert ceramic material.	"		Sph.	0.78 g/cc	Alumina	—	✓
S 524	Conversion of S compounds into H_2S	Claus unit tailgas		Sph.	0.77 g/cc	Alumina	Ni/Mo	✓
S 534	"	"		Sph.	0.77 g/cc	Alumina	Co/Mo	✓
UNOCAL CORP.								
Selectox-33	Solid catalyst for oxidation of H_2S to Sulfur and catalytic incineration of SO_2	Claus tail gas, acid gas		Cyl. Ext.	"P"	"P" Licensees	Non-noble metals	BSR/Selectox, Selectox, Recycle Selectox Process
Selectox-32	"	"		Cyl. Ext.	"P"	"P"	"	"
N-25	Hydrogenation, hydrolysis of gaseous sulfur compounds	"		Cyl. Ext.	"P"	"P"	"P"	Beavon Sulfur Removal; (BSR) Licensees
N-39	"	"		Cyl. Ext.	"P"	"P"	"P"	Beavon Sulfur Removal (BSR) Licensees
N-239	"	"	H_2S	"	"	"	Co/Mo	"
UNITED CATALYSTS INC.								
C29-2-02		Claus tail gas		Ext.	37	Al_2O_3	Co/Mo	✓
C29-2-03	Stabilized carrier (SC)	"		Ext.	"	"	"	✓
C29-2-04	(SC) plus lower metals	"		"	"	"	"	✓
C29-3-03	(SC) plus spherical form (SF)	"		Spheres	55	"	"	✓

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
C29-3-04	(SC), (SF), plus lower metals	"		"	50	"	"	✓
C29-4-03	Composition, (SC), (SF)	"		"	55	"	Ni/Mo	✓
N-239	(See Unocal Corp.: Claus Unit Tail Gas)							
G-41P	COS hydrolysis	High CS_2 & COS Conversion		Ext.	34-38	Al_2O_3	"P"	✓

Other refining catalysts

	Purpose of catalyst	Application (feedstock)	Application (product)	Form (sphere ring, cylinder, etc.)	Bulk density	Carrier, support	Active agents	Availability unrestricted sale: ✓, except where noted.
AMERICAN CYANAMID CO.								
TSR-10	(See Unocal "Other refining catalysts")							
SOAR-100	"							
BASF AG								
O 3-14	High selectivity	$HCl/O_2/C_2H_2$	EDC	5mm rings	0.80 kg/l	Alumina	CuCl/KCl	✓
O 4-26	High yield and purity	O-Xylene	Phthalic anhydride	rings	1.0 kg/l		V_2O_5	BASF licensees
BP								
CDW-12	Producing specialty and lube oils	Distillates and raffinates	High quality specialty and lube oil	Cyl.		Zeolite	Noble metal	Licensees of BP catalytic dewaxing-process
CDW 14	Improving low temp. properties of middle distillates	Kerosenes gas oils	Jet fuels, kerosenes diesel oils heating oils	Cyl.		Zeolite	Noble metal	Licensees of BP's catalytic dewaxing process
FF-62	Lube oil color improvement	Solvent refined lube oils	Finished lube oils	Sph.		"P"	"P"	BP Ferrofining process
ENGELHARD CORP.								
HZ-1*	Gas oil cracking in Houdriflow and TCC units. HZ-1 is octane catalyst.	HGO	Olefins, LPG, and LCO production	Ext.	0.95 g/cc	In-situ zeolites on Si/Al	Zeolites/No rare earth	✓
HZ-PLUS*	High attrition resistant version of HZ-1	HGO	Olefins, LPG, and LCO production	Ext.	0.95 g/cc	In-situ zeolites on Si/Al	Zeolites/No rare earth	✓
EMCAT*-100	Rare earth exchanged version of HZ-P for maximum liquid yield.	HGO; toluene and mixed C_9 transalkylation.	LPG, gasoline and LCO; xylenes and benzene	Ext.	0.95 g/cc	In-situ zeolites on Si/Al	Zeolites Rare earth exearth exchanged	✓
EMCAT*-80	Lower activity version of Emcat-100	"	"	Ext.	0.95 g/c	In-situ zeolites on Si/Al	"	✓
HZ-PLUS*, EMCAT*-100P and EMCAT*-80P	Prepromoted products for max. CO burning.	Heavy gas oil cracking	LPG gasoline and LCO	Ext.	0.95 g/cc	In-situ zeolites on Si/Al	Zeolite-non rare earth (HZ-P) and rare earth exchanged (EMCAT)	✓
HRD-264	Sulfur removal	Reformer feedstock	Pretreated naphtha or untreated low S naphtha	Cyl.	"P"	"P"	"P"	Licensing
HALDOR TOPSOE								
HTZ-3	Fine desulfurization of steam reforming feed stocks	Methane, LPG, naphtha, ref. off gas	Sulfur free hydrocarbon	Extrusions	78		ZnO	✓
SK-12	High temperature CO conversion	Steam reforming effluent	Gas with 2-3% CO	Cyl.	65		Oxides of Fe/Cr	✓
LSK	Low temperature CO conversion, regenerable, chlorine resistant	HT-shift effluent	Gas with 0.1-0.3% CO	Cyl.	66		Cu, Oxides of Zn/Cr	✓
LK-801	Low temperature CO conversion, sulfur resistant	HT-shift effluent	Gas with 0.1-0.3% CO	Cyl.	67		Cu, oxides of Zn/Al	✓
PK-5	Methanation	H_2 with up to 2% $(CO+CO_2)$	H_2 without oxygen containing contaminants	Extruded rings	39	Alumina	Ni	✓
INSTITUTO MEXICANO DEL PETROLEO								
IMP-TPC-1	Cumene production	Benzene Propane-Propylene	Cumene	Cyl.	0.86-0.95 g/cu cm	—	Fe-K as oxides	IMP
IMP-ES-1	Styrene production	Ethylbenzene water vapor	Styrene	Cyl. (Ext.)	1.0-1.4 g/cu cm	—	Fe-K as oxides	IMP
PROCATALYSE								
RS 103	Oxidation of S compounds	$S\text{-}H_2S$, COS-CS_2, RSH	SO_2	Sph.		Al_2O_3	Metallic oxides	✓
DN 281	NOx reduction	Industrial gas	N_2	Sph.		Al_2O_3	Metallic oxides	✓
FF 62	Lube oil hydrofinishing	Extracted lube oil	Finished base oil	Sph.		Al_2O_3		Licensees BP process

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
HR 346	Wax hydrotreating	Slack wax	Food grade wax	Cyl.		Al_2O_3	Ni-Mo	✓
SHELL CHEMICAL								
S 538	CO/H_2O shift reactions	Treatment of coal and oil gasification derived syn-gas.		Sph.	0.82 g/cc	Alumina	Co/Mo	Sale
UNOCAL CORP.								
TSR-10	Trace sulfur removal	Naphthas	Feed to catalytic reformer	Shaped ext.	"P"	"P"	"P"	TSR process Licensees
TSR-11	"	"	"	"	"P"	"P"	"P"	"
SOAR-100	Arsenic removal	Shale oil, coal liquids, etc.	Low arsenic product	Shaped Ext.	"P"	"P"	"P"	Shale oil process licensees
UNITED CATALYSTS								
C53-2-01	COS hydrolysis	FCC propylene/propane off gas		Ext.	28-32	Al_2O_3	PTS	✓
G-132	Arsine removal	"		Tab	75-85		Cu	✓
C28-1-01	Sulfur removal	Naphthas, feed to cat reformer		Ext.	45-50	"P"	"P"	✓
TSR-11	(See Unocal COrp., other refining catalysts)							
C125-1-01	HCl removal	H_2 offgas cat reformer		Ext.	47-53	Zn	Ca	✓
G-92	"	"		sph.	49-55	Al_2O_3	Na	✓
UOP INC.								
TA-3	Transalkylation	Toluene and C_9 aromatics	Benzene, xylenes	Cyl.	47	"P"	"P"	Licensees
DEH-5	Paraffin dehydrogenation	C_6 to C_{20} paraffins	C_6 to C_{20} monoolefins	Sph.	19	Alumina	Pt	"
DEH-6	Light paraffin dehydrogenation	C_3 to C_5 paraffins	C_3 to C_5 monoolefins	Sph.	37	Alumina	"P"	"
DEH-7	Paraffin dehydrogenation	C_6 -C_{20} n-paraffins	C_6 -C_{20} monolefins	Sph.	20	Al_2 O_3	"P"	
SOX-3	Gas phase sulfur removal	Stack gas	—	Sph.	22	Alumina	Cu	"
NOX-3	Gas phase NOx removal	Stack gas	—	Sph.	50	TiO_2	V and W	Licensees
A-2	Alkylation of benzene with ethylene	Ethylene & benzene	Ethylbenzene	Sph.	35	Alumina	"P"	"
KALI-CHEMIE AG								
KC PERLKATOR series	Moving bed catalytic cracking in TCC and Houdriflow operation	Gas oil cracking	C_3/C_4 - Olefins, LCO	Beads which give -low attrition-high crush strengths	0.8 g/cc	Silica/Alumina	Acid sites	KC-Perlkator equivalent to Durabead manufactured under license of Mobil Oil Corp.
D 1	TCC/HCC	HGO/VGO	"	Bead	0.60 g/cc	"	Amorphous aluminosilicate	✓
D8	"	"	Gasoline distillate	"	0.90 g/cc	"	Stabilized zeolites	✓
D9A	"	"	"	"	"	"	"	✓
D10A	TCC/HCC with max. CO burning in kiln gas	"	"	"	"	"	Stabilized zeolites with CO combustion promoter	"
DNZ	TCC/HCC	"	High octane gasoline	"	"	"	Stabilized zeolites	✓
XP-catalyst	Xylenes-Plus process	Transalkylation and disproportionation of Toluen	Xylenes benzene	"	"	"	Rare earth exchanged Zeolites	✓

Combustion Promotors (FCC)

Catalyst designation	Primary distinguishing characteristics	Application	Additive to or component of catalyst	Form	Carrier, support	Active agents	Available to refiners by:
AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS							
Ketjenoxycat-50 (KOC-50)	Stability	CO combustion		Powder	Alumina	Pt	✓
AMBUR CHEMICAL CO. INC.							
CCA Brand combustion promoters	Utilize a combination of noble metals on an active alumina substrate	All FCC units where CO combustion promotion is desired	Additive	Powder	High purity alumina	Platinum & Palladium	✓
CCA-1®	Highest activity	Partial or complete combustion of CO	Additive to FCC catalyst	Powder	Alumina	Platinum & Palladium	✓
CCA-5+®	High activity	"	"	"	"	"	"
CCA-7®	High activity/improved support	"	"	Spray-dried microsphere	Platinum	"	

OGJ international refining-catalyst compilation—continued

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
CCA-8*	"	"	"	"	"	Platinum & palladium	"	"
CATALYSTS & CHEMICALS INDUSTRIES CO. LTD.								
SP-10S	CO combustion - solid promoter	FCC feed		Sph.	0.90 g/cc	Alumina	"P"	✓
DAVISON CHEMICAL DIVISION, W.R. GRACE & CO.								
CP-3	High activity,stability	Partial and complete CO combustion	Additive		Microsph.	"P"	"P"	✓
ENGELHARD CORP.								
COCAT*-1	Low activity	Partial CO combustion regeneration.	Additive to FCC catalyst		Micro-sph.	Si/Al	Precious metal	✓
COCAT*-5	High activity	Full CO combustion FCC regeneration	Additive to FCC catalyst		Micro-sph.	Si/Al	Precious metal	✓
COCAT*-7	High activity improved support	Full CO combustion FCC regeneration	Additive to FCC catalyst		Micro-sph.	Si/Al	Precious metal	✓
KATALISTIKS INC.								
KCP-8	High activity	Partial and complete combustion of CO	Additive or blended with FCC catalyst		0.80 g/cc (ABD)	"P"	Precious metals	✓
KCP-5	Medium activity	"	"		0.80 g/cc (ABD)	"P"	"	"
UOP INC.								
UNICAT* CI-3	Active metal impregnated on carrier base.	For combustion in-situ of CO in FCCU regenerator	Added with normal catalyst makeup to achieve a level of 0.5 wt ppm Pt on catalyst inventory		Powder	Alumina, Silica Alumina	Platinum	Sale
W.R. GRACE CATALYSTS PTY. LTD.								
CP-3	(See Davison Chemical Division, W.R. Grace & Co. FCC listing)							

Sulfur oxides reduction catalyst (FCC)

Catalyst designation (list all in a series)	Characteristics	Form	How introduced to FCC system
ARCO PETROLEUM PRODUCTS CO.			
ARCO HRD-276	Combines with SOx in regenerator releases it as H_2S in reactor	Additive, not cracking catalyst	Batch or continuous
DAVISON CHEMICAL DIV. W. R. GRACE			
Additive R	Additive designed to reduce regenerator flueMicrosph. gas sox emissions	[illegible] cracking catalyst	Via separate
ENGELHARD CORP.			
ULTRASOX™	ABD-0.9 gm/cc typical FCC particle size SA-200m²/gm (fresh) Engelhard attrition index-0.7 wt%/second P	Typical FCC catalyst	As fresh makeup. This catalyst incorporates zeolite activity, selectivity and SOx reduction into one - add to system same as std. FCC cat.
MAGNASIV 370S	"	"	
W.R. GRACE CATALYSTS PTY. LTD.			
Additive R	(See Davison Chemical Div. FCC listing)		
KATALISTIKS INC.			
Desox	Removes SOx from FCC flue gas and releases as H_2S in Rx products.	Microsphere, 0.73 g/cc (ABD)	Additive or blended with FCC catalyst.

Abbreviations for catalyst compilation

ABD	— Apparent bulk density
AGO	— Atmospheric gas oil
HC	— Hydrocracking, or -cracked
Cyl.	— Cylinder
DAO	— Deasphalted oil
DO	— Diesel oil
Ext.	— Extrudate
HAGO	— Heavy atmospheric gas oil
HDM	— Hydrodemetallization
HDN	— Hydrodenitrogenation
HDS	— Hydrodesulfurization
HDT	— Hydrotreating, or -treated
HFO	— Heavy fuel oil
HGO	— Heavy gas oil
NVGO	— Heavy vacuum gas oil
LCO	— Light cycle oil
LGO	— Light gas oil
LSFO	— Low sulfur fuel oil
LSR	— Light straight-run
'P'	— Proprietary
RDS	— Resid desulfurization
Sph.	— Sphere
VGO	— Vacuum gas oil

Deletions from 1985 compilation

Category	Company	Designations deleted
Fluid catalytic cracking	Akzo Chemie/Akzo Chemie America/ Ketjen Catalysts	MX-7, MZ-7X MZ-7 Super MZ-101, MZ-11, MX-11X, MZ-11 Super KMR-93, KMR-95, KMR-97
	Catalysts & Chemical Industries Co. Ltd.	MRZ-060, SZ-C, SZ-N, HA
	Crossfield Catalysts	XL-90
	Davison Chemical Division, W. R. Grace & Co.	DAB-400, DAB-300, DAB-250, Titan
	Englehard Corp.	ULTRASIV 450/450P, 440/440P, 430/430 P
	Harshaw/Filtrol	ROC-25, ROC-50, HMT MOC-1, MOC-2, FSS-Y, ZSM-5
	Katalistiks International Inc.	KX-100, KX-431, KX-419
Hydrocracking	Procatalyse	HYL-544
	Shell	S-327
Mild hydrocracking	Catalysts & Chemicals Industries Co. Ltd.	CDS-D13
	Katalco Corp.*	477S, 499S, 482, 483, 484, NM502, NM502S, 52
Hydrotreating/hydrogenation, Saturation catalysts	Harshaw/Filtrol	107, 102, 106
	Shell	S-327, S-244, S-434
	Katalco Corp*	483, 484, 482, NM503, DM500
Hydrorefining	Katalco Corp.	483, 484
Polymerization	UOP Inc.	SPA-4
Claus unit tail gas treatment catalysts	Procatalyse	HR-103
	Shell	S 524
Other refining catalysts	BASF AG	0 3-14, 0 4-26
	Kali-Chemie AG	DNZ
Combustion promotors (FCC)	Ambur Chemical Co. Inc.	CCA-7 (Replaced by CCA-6)
Sulfur oxides reduction catalysts (FCC)	ARCO Petroleum Products Co.	HRD-276

*Katalco Corp. has removed the "NM" from its listed designations.

1986 additions to international/catalyst compilation

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
				Catalytic naphtha reforming				
AMERICAN CYANAMID CO.								
Aeroform PHF-5 & PHF-5A	Monometallic; differing particle size.	Naphtha	Gasoline or BTX	Cyl.	~ 42	Alumina	"P"	✓
KX-120 KX-130 KX-160	(See Exxon Research & Engineering Listing)							✓
Trilobe KX-130	(See Exxon Research & Engineering Listing) Shaped extrudate			Shaped Ext.				✓
CYANAMID KETJEN								
CK-542 Trilobe	High-rhenium, high particle density, shaped catalyst	Naphtha (Low sulfur)	Gasoline or BTX	*	45	Alumina	Platinum rhenium chloride	✓
KX-120 KX-130 KX-160 KX-170	See Exxon Research & Engineering							Licenses of Exxon's Powerforming process
ENGLEHARD CORP.								
E-611	Very high stability	All naphthas with feed Sulfur of 0.1 ppm wt	Motor fuel or aromatics	Cyl.	45	Gamma Alumina	Platinum Rhenium	✓

1986 additions to international/catalyst compilation — (continued)

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
E-801	Equivalent stability to E603 at higher activity	All naphthas with feed sulfur < 1 ppm wt.	Motor fuel or aromatics	Cyl.	51	Gamma Alumina	Platinum/ Rhenium	✓
E-802	Equivalent stability to E611 at higher activity	All naphthas with feed sulfur <= 0.5 ppm wt.	"	"	51	"	"	"
E-803	Equivalent stability to E611 at higher activity with optimized metals loading	"	"	"	51	"	"	"
E-804	Equivalent stability and activity to E-801, optimized metals loading	"	"	"	51	"	"	"
(Note: Preceeding catalysts available in higher density at 49.5 lb/cu ft. They are designated HD, for example E – 301 HD).								
UOP INC.								
R-8	Monometallic, oxidized	Unhydrotreated naphtha semi-regenerative	Gasoline, aromatics	Sph.	32	Alumina	Pt	Contact UOP
R-9	Higher activity monometalic, oxidized	Semi-regen. or swing reactor	Gasoline, aromatics	Sph.	32	Alumina	Pt	"
R-11	Higher activity monometallic, reduced and sulfided	Semi-regen. or swing	Gasoline, aromatics	Sph.	32	Alumina	Pt	"
R-12	Monometallic, higher stability than R-11, reduced and sulfided	Semi-regen.	Gasoline, aromatics	Sph.	32	Alumina	Pt	"
R-55	Monometallic, higher activity and stability than R-12, reduced and sulfided	Semi-regen. or swing	Gasoline, aromatics	Ext.	Dense-loaded 52	Alumina	Pt	"
R-15	Monometallic, reduced and sulfided	Semi-regen.	LPG, gasoline	Sph.	32	Silica/ Alumina	Pt	"
R-16H	Bimetallic, higher stability than monometallics, reduced and sulfided	High severity, Semi-regen. "	Gasoline, aromatics	Sph.	32	Alumina	Pt/Re	"
R-16F	Bimetallic, low Pt, higher stability than monometallics, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph. Sph.	32 32	Alumina Alumina	Pt/Re Pt/Re	" "
R16G	Bimetallic, higher activity and stability than R-16F and H, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	32	Alumina	Pt/Re	"
R-18	Bimetallic, higher activity and stability than R-16 series, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	37	Alumina	Pt/Re	Contact UOP
R-22	Bimetallic, higher yields than Pt/Re, reduced state	Continuous catalyst regeneration (CCR) or Semi-regen.	Higher production of octane-barrels and aromatics	Sph.	32	Alumina	"P"	"
R-30	Bimetallic, higher yields and activity than Pt/Re, higher Pt than R-32, reduced state.	CCR or swing reactor	"	Sph.	35	Alumina	"P"	"
R-32	Bimetallic, higher yields and activity than Pt/Re, reduced state	CCR	"	Sph.	35	Alumina	"P"	"
R-50	Bimetallic, higher activity and stability than R-16 series, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Ext.	Dense loaded 52	Alumina	Pt/Re	"
R-51	"	"	"	"	42	Alumina	Pt/Re	"
R-60	Bimetallic, higher stability than R-50, high activity, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	45	Alumina	Pt/Re	"
R-62	Bimetallic, Lower Pt than R-60, higher stability than R-50, high activity, reduced and sulfided	High severity, semi-regen.	Gasoline, aromatics	Sph.	44	Alumina	Pt/Re	"

Dimerization catalysts

KALI-CHEMIE AG								
Beadcat PK Series	Unique mechanical and thermal stability	C_3/C_4 olefins	Gasoline	Bead	0.80 g/cc	Silica/ alumina	Acid sites	✓

1986 additions to international/catalyst compilation — (continued)

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
Isomerization C_4 catalysts								
UOP INC.								
I-4	High activity for n-butane isomerization to iso-butane			Sph.	34	Alumina	Pt	Contact UOP
I-8	Higher activity than I-4 for n-butane isomerization to iso-butane			Ext.	48	Alumina	Pt	"
Isomerization (C_5 and C_6) catalysts								
PROCATALYSE								
IS632	Non-chlorinated high activity	C_5/C_6 paraffins	High octane gasoline or isomers	Ext.	0.50 g/cc	Special	Pt.	✓
UOP INC.								
I-4	High activity catalyst	Desulfurized LSR fractions; reformate light fractions		Sph.	34	Alumina	Pt	Contact UOP
I-7	High activity, sulfur and water tolerant	SR or HDT, Ext. C_5/C_6 streams		Ext.	36	"P"	Pt	"
I-8	High activity catalyst for low pressure application	"		Cyl.	48	Alumina	Pt	"
Isomerization (xylenes) catalysts								
KALI-CHEMIE AG								
Beadcat PK Series	Xylene isomerization	o, m, p xylenes	m, p xylenes	bead	0.80 g/cc	Silica/ alumina	Acid sites	✓
UOP INC.								
I-9	High activity & high selectivity. High ethylbenzene conversion	Mixed xylenes, ethylbenzene from reformate or pygas	Para-xylene, and/or ortho-xylene	Sph.	37	"P"	"P"	Contact UOP
Fluid catalytic cracking								
AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS								
Ketjen Low-Coke 80 plus/Y Series	Extra low delta coke RON	VGO/light resid	Gasoline, middle distillates	M.S.	0.72/0.80	USY low RE zeolite		✓
KLC-8St	ASTM-MAT: 73 wt %, SA 230 sq m/g	"	"	"	"	"		
KMC-57	ASTM-MAT: 82 wt %, S.A. 265 sq m/g	VGO/resid	Gasoline LCO, octane, cetane	M.S.	0.75	Active matrix	Low Re zeolites	"
Ketjen Multicrack 20/50 plus/Y Series	Max. total distillates, bottoms, conv., lower delta coke and extra RON	VGO/resid	Gasoline, LCO, octane/cetane	M.S.	0.72/0.78	"	USY-low RE zeolite	✓
KMC/25+	ASTM MAT: 75 wt %, S.A. 240 sq m/g	"	"	"	0.75	"	"	"
KMC/55+	ASTM-MAT: 77 wt % S.A. 255 sq m/g	"	"	"	0.72	"	"	"
Ketjen Octa-Boost 610 Series	Low soda, attrition resistant	VGO, resid	Gasoline, LCO	M.S.	0.70/0.75	Active matrix	USY	✓
KOB-615-1/2/3	ASTM-MAT: 67/69/71 wt %, S.A. 234 sq m/g	"	"	"	0.75	"	"	"
KOB-617-1/2/3	ASTM-MAT: 70/73/76 wt %, S.A. 265 sq m/g	"	"	"	0.73	"	"	"
CATALYSTS & CHEMICALS INDUSTRIES CO., LTD.								
MRZ-230	High gasoline yield & high metal tolerance	FCC feed & high metals feeds	Gasoline	Microsph.	0.74 g/cc	SiO_2/Al_2O_3	Zeolite	✓
Hylic-30	High liquid	FCC feed	"	"	0.80 g/cc	"	"	✓
-40	"	"	"	"	"	"	"	✓
Hycon-20	High octane metals tolerance	"	"	"	0.78 g/cc	"	"	✓
-30	"	"	"	"	"	"	"	✓
-40	"	"	"	"	"	"	"	✓
Valec-50	"	"	"	"	0.70 g/cc	"	"	✓
-60	"	"	"	"	0.68 g/cc	"	"	✓
-70	"	"	"	"	0.65 g/cc	"	"	✓
CROSFIELD CATALYSTS								
XL Series	Active matrix giving good bottoms cracking and high gasoline and octane selectivity	Gas oils	Bottoms up-grading, high liquid prod., octane and cetane	Microsph.		Silica/ alumina	Zeolite/ matrix	✓

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
XL 60	″	″	Low activity	″	0.87 g/ml (ABD)	″	″	″
XL 80	″	″	Medium activity	″	0.86 g/ml (ABD)	″	″	″
XL 100	″	″	High activity	″	0.84 g/ml (ABD)	″	″	″
XLS series	High metals tolerance and hydrothermal stability under severe conditions. High unit retention.	Gas oils & resids	High liquid products from resid operation octane and cetane	Microsph.		Silica/ alumina	Zeolite/ matrix	✓
XLS-3	″	″	Low activity	″	0.87 g/ml (ABD)	″	″	″
XLS-2	″	″	Med. activity	″	0.86 g/ml (ABD)	″	″	″
XLS-1	″	″	High activity	″	0.85 g/ml (ABD)	″	″	″
SLS series	Excellent coke selectivity. Flexible for maximum gasoline and/or mid distillate operation.	Gas oils and resids	Max. gasoline and octane barrel catalyst. High selective bottom cracking	Microsph.		Silica/ alumina	Zeolite/ matrix	✓
SLS-60	″	″	″	″	0.78 g/ml (ABD)	″	″	″
SLS-80	″	″	″	″	0.77 g/ml (ABD)	″	″	″
SLS-100	″	″	″	″	0.76 g/ml (ABD)	″	″	″
SLS series with max. metals resistance	High metals tolerance activity and stability achieved by employing Crosfield's metals passivation technology	Gas oils and resids	Especially formulated for resid operations	Microsph.		Silica/ alumina	Zeolite/ matrix	✓
SLS 800	″	″	″	″	0.77 g/ml (ABD)	″	″	″
SLS 1000	″	″	″	″	0.76 g/ml (ABD)	″	″	″
Quantum series	Maximum octane enhancement without gasoline penalty. High activity/stability	Gas oils and resids	Max. octane, min. coke. High product yields.	Microsph.		Silica/ alumina	Zeolite/ matrix	✓
Quantum 80	″	″	″	″	0.73 g/ml (ABD)	″	″	″
Quantum 100	″	″	″	″	0.72 g/ml (ABD)	″	″	″
Quantum series with max. metals resistance	High metals tolerance, activity, and stability achieved by employing Crosfield's metals passivation technology	Gas oils and resids	Especially formulated for resid operations	Microsph.		Silica/ alumina	Zeolite	✓
Quantum 800	″	″	″	″	0.72 g/ml (ABD)	″	″	″
Quantum 1000	″	″	″	″	0.73 g/ml (ABD)	″	″	″
DAVISON CHEMICAL DIVISION, W.R. GRACE & CO.								
GXO-41*	Octane enhancement, bottoms coker cracking coke selectivity, excellent stability	Gas oil, resid gas oils, high nitrogen feeds	Gasoline & distillate	Microsph.	0.75 g/cc (ABD)	"P"	Zeolite/Matrix	✓
GXO-40	″	″	″	″	0.75	″	″	″
GXO-27	″	″	″	″	0.77	″	″	″
* Catalysts arranged in decreasing order of activity								
GXO-28*	Max. stability GXO series. Octane enhancement, coke selectivity, bottoms upgrading, excellent metals tolerance	Gas oil, resid, coker gas oils, high nitrogen feeds.	Gasoline and distillate	Microsph.	0.75 g/cc (ABC)	"P"	Premiums Z-14US Zeolite	✓
GXO-25+	″	″	″	″	0.76 g/cc (ABC)	″	″	″
GXO-25	″	″	″	″	0.76 g/cc (ABC)	″	″	″
* Catalysts arranged in decreasing order of activity.								
ENGELHARD CORP.								
Octasiv Plus 680/P, 670/P, 660/P	Oct 680 highest activity, stability, and metals tolerance. P designates grades with CO combustion promoter.	Gas oils, gas oil-resid, and resids	Maximizes octane-barrel production. Superior activity, hydrothermal stability and metals tolerance	Microsph.	1.0 g/cc	In situ Silica/ alumina	Ultrastabilized zeolite, low Re, low matrix surface area	✓
Octasiv Plus 580/P, 560/P	580 highest activity, stability, and metals tolerance. P designates grades with combustion promoter	Gas oils, gas oil/resid, and resids	Max. octane and olefin, plus bottoms upgrading metals, and hydrothermal stability	Microsph.	1.0 g/cc	In situ-Silica/ alumina	Ultrastable zeolite, moderate matrix surface area	✓

1986 additions to international/catalyst compilation — (continued)

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
Octasiv Plus 150/P, 140/P	150 highest activity. P designates grades with combustion promoter	*	Excellent catalyst activity, bottoms upgrading, and metals tolerance. Octane advantage over fully Re exchanged non-ultrastable catalysts	Microsph.	1.0 g/cc	*	Ultrastable zeolite, rare earth, moderate matrix surface area	✓
Ultradyne Plus 1530, 1540, 1550/P, 1560/P	UDP 1580 highest activity. P designates grades with CO combustion promoter	*	Same as Ultradyne, but with improved octane performance	Microsph.	1.0 g/cc	*	Ultrastable zeolite, low rare earth, low matrix surface area	✓
Dynasiv Plus 430, 440, 450, 460, 470, 480/P	DSP-480 highest activity. P designates grades with combustion promoter.	Gas oils, gas oil/resid and resids	Partial octane catalyst with low coke and gas selectivtivity, excellent hydrothermal stability	Microsph.	1.0 g/cc	In situ Silica/alumina	Partially reduced unit cell size with low rare earth	✓
HARSHAW/FILTROL								
FGO-1DY FGO-2DY FGO-3DY	General purpose, three activity levels—"3" highest	Gas oils or high metals resid (blending catalyst)	High gasoline selectivity, good bottoms, upgrading, cost effective gas oil or metals control catalyst	Microsph.	0.80 g/cc (ABD)	Active alumina	High rare earth dealuminated ultrastable (DY) zeolite, active crystalline aluminum matrix	✓
FSS-1DY FSS-2DY FSS-3DY	Very stable, all purpose. Three activity levels—"3" highest	Gas oils, resids, high nitrogen feed.	High gasoline yield excellent bottoms upgrading, for severe operations	Microsph.	0.80 g/cc	Active alumina	High rare earth DY zeolites, low soda, active stable crystalline alumina matrix	✓
Octex-1DY Octez-2DY Octex-3DY	Stable, high octane gasoline. Three activity levels—"3" highest	Gas oils or resid	High gasoline yields & O.N. low coke, high LCO cetane No., excellent bottoms upgrading	*	*	*	Moderate rare earth, DY zeolite, active stable crystalline alumina matrix	✓
ROC-1DY	Resists metals, Low coke make, Highest Activity.	Heavy gas oils, high metals resid	*	*	*	*	Moderate to high rare earth, DY zeolites, active stable crystalline alumina matrix	✓
SOC-1DY SOC-2DY	Very stable, low coke make, high activity. Two activity levels, "2" highest	HGO, high metals resids.	High gasoline yield & O.N., low coke, high LCO, cetane, excellent bottoms upgrading for severe operations	*	*	*	Low to moderate rare earth, DY zeolites, low soda, active stable crystalline alumina matrix	✓
FX-1 FX-2	Very stable, metals resistant, low coke make, high activity. Two activity levels, "2" highest	Heavy gas oils, high metals resids	Max. octane barrels in severe regenerator and resid applications, excellent bottoms upgrading				Moderate rare earth, stable zeolites, active stable crystalline alumina matrix	✓
OC	Octane-type catalyst, low cost/limited production	Gas oils through light resids	High gasoline yield & O.N., low coke, excellent bottoms upgrading	*	*	*	*	✓
DOC-1DY DOC-2DY	Diesel oil production	Gas oils resids.	Max. LCO yield with high cetane, excellent bottoms upgrading	*	*	*	Low rare earth DY zeolite, active crystalline matrix	✓
Focus-1 Focus-2	High octane gasoline, low gas and coke make.	Gas oils through resids.	High yield of highest ON gasoline low coke & gas make. Excellent bottoms upgrading	Microsph.	0.80 g/cc (ABD)		*	✓
KATALISTIKS, INTERNATIONAL INC.								
Alpha-540	High activity octane catalyst	Gas oils, resids, reduced crudes	Max. octane barrels with high selectivities	Microsph.		Silica/alumina	LZ-210 in an active matrix	✓
Alpha-640	*	*	*	*		*	*	*
Beta-540	Max. octane	Gas oils, resids, reduced crudes	Max. octane	Microsph.		Silica/alumina	LZ-210 in an active matrix	✓
Beta-640	*	*	*	*		*	*	*

1986 additions to international/catalyst compilation — (continued)

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
Beta-600 Prime	Highest possible octane	Gas oils, resids, reduced crudes	Max. octane	Microsph.		Silica/ alumina	LZ-210 in an active matrix	✓
Delta-300	Max. RON and MON without yield penalty	"	High liquid, max. mid barrel yield. Low 650 + yield and coke yields.	"	0.76 g/cc (ABD)	"	USY zeolite and low surface area matrix	"
Delta-444	High RON and MON with increased gasoline	"	High gasoline yields with high octane	"		"	USY zeolite with rare earth and active matrix	"
Delta-454	"	"	"	"		"	"	"
Delta-455	"	"	"	"		"	"	"
Delta-464	"	"	"	"		"	"	"
Sigma-500 Plus	High octane barrels with good coke and gas selectivity.	"	High liquid, max. mid barrel yield. Low coke and gas make	"	0.74 g/cc	"	High silica, low rare earth zeolite and matrix	"
Sigma-600 Plus		"		"	0.72 g/cc	"		"
KD-419	Max. RON and MON	Gas oils, resids, reduced crudes	High liquid, mid-barrel yields. Low gas, coke and 650°F. yields.	Microsph.	0.74 g/cc	Silica/ alumina	High silica zeolite and matrix	✓
KD-419+	"	"		"	"	"	High silica, low rare earth zeolite and matrix	"
BMZ-200	Flexible for max. distillate or max. gasoline.	Gas, oil, resid, reduced crude, high nitrogen, coker gas oil	High liquid, maximum mid-barrel yield. Low 650+ yield and low gas. Attrition resistance. Low bromine number. High isobutane yield.	Microsph.	0.76 g/cc (ABD)	Silica Alumina	High silica, fully rare earth exchanged zeolites & low surface area matrix.	✓
BMZ-300	"	"		"	0.75 g/cc (ABD)	"	"	"
BMX-400	"	"	"	"	0.74 g/cc (ABD)	"	"	"
BMX-600	"	"	"	"	0.72 g/cc (ABD)	"	"	"

Hydrocracking

AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS/NIPPON KETJEN								
Ketjenfine H-oil catalyst (HRI/ Texaco)		Resid hyrocracking		Cyl. ext.		"P"	CoMo & NiMo versions	Licensees of H-oil process
Ketjetfine HC 143	(See BP hydrocracking listing)	VGO hydrocracking		Cyl. ext.		"P"	"P"	Licensees of BP
AMERICAN CYANAMID CO.								
HC-102	(See Unocal listing)							✓
MD-2	(See BP Listing)							✓
GHC	(See Gulf Research listing)							✓
DHC								✓
ARCO TECHNOLOGIES INC.								
ARCO H-H Cat		Raw lube stocks	High quality lube products	Cyl.	48			Licensees of Arco H-H Lube Oil Process
PROCATALYSE								
HYC 542	High cracking activity	Gas oil, vac. gas oil	Gasoline and distillates	Ext.		Special	NiMo	✓
GULF RESEARCH & DEVELOPMENT CO.								
GHC	Maximum gasoline oriented hydrocracking	Distillates and light gas oils	Gasoline, naphtha, kerosene and jet fuel	Cyl.	50-60	Silica Alumina	"P"	✓
DHC	Maximum distillate oriented hydrocracking	Distillates and light and heavy vacuum gas oils	Furnace oil, diesel, jet fuel and kerosene	Cyl.	50-60	Silica Alumina	"P"	✓
SHELL CHEMICAL								
S-424	Denitrification and single stage hydrocracking	Coal oil hydrocracking and single stage hydrocracking		Shaped Ext.	0.82 g/cc	Alumina	Ni/Mo/P	✓
S-411	Denitrification and first stage hydrocracking	Single stage hydrocracking		"	0.85 g/cc	"	"P"	✓
UOP INC.								
DHC-100	Bifunctional catalyst, excellent hydrogenation function, improved cracking activity, greater temperature stability	VGO, DAO, CGO, other non-straight run gas oils	High selectivity to mid distillates	Ext.	"P"	"P"	"P"	

1986 additions to international/catalyst compilation — (continued)

Mild hydrocracking

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
AKZO CHEMIE/AKZO CHEMIE AMERICA/KETJEN CATALYSTS/NIPPON KETJEN								
KF-1001	Cobalt moly.	Convert VGO feeds	Distillate boiling range material	Cyl.	46	"P"		
KF-1002	Nickel moly.	"	"	Cyl.	48	"P"		
KF-1011	"	"	"	Cyl.	48	"P"		
KF-1012	CoMo	"	"	"	37	"P"		
KF-1014	CoMo	"	"	"	37	"P"		
TLF-141 (Elf)	"P"	Pour pt. protection		Cyl.	"P"	"P"		Licensees of Elf
CATALYSTS & CHEMICALS INDUSTRIES CO., LTD.								
HT-DS	High mid-distillate yield	VGO	Kerosine, diesel oil & desulfurized oil	Cyl.	0.78 g/ml	Alumina		✓
HARSHAW/FILTROL								
HPC-70	High activity for nitrogen and polynuclear aromatics saturation, high sulfur removal activity, intended for severe applications	HGO/VGO	FCC feed	Kloverleaf, ext. 4-lobe	51	Alumina	Nickel oxide (5.0%) molybdic oxide (20.0%)	✓
SHELL CHEMICAL								
S-424	Combined conversion and desulpherization activity	VGOs	Mid-distillates plus treated VGO	Shaped Ext.	0.82 g/cc	Alumina	Mi/No/P	✓

Hydrotreating/hydrogenation, saturation catalysts

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
AMERICAN CYANAMID CO.								
Trilobe HON-34 (1.6) HON-34 (3.2)	Different particle sizes	Naphthas thru HGO		Shaped ext.	~35	Alumina	NiO/MoO_3	✓
Rifled Trilobe HDN-60 (1.6) HDN-60 (3.2)	"	"		"	~50	"	NiO/MoO_3	✓
CSM-481 CSM-482		"		"	"P"	"P"	"P"	Licensees of Compagnie Francaise de Raffinage
HARSHAW/FILTROL								
HPC-70	Highest activity for nitrogen and polynuclear aromatics removal, high activity for S removal plus intended for severe operations	VGO, HVGO, LCO, CGO, coker distillates and naphtha, lube stocks	FCC feed, lube, gasoline component, jet fuel.	Kloverleaf ext.	51	Alumina	Nickel oxide (5.0%), molybdic oxide (20.0%)	✓

Hydrorefining

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
AMERICAN CYANAMID CO.								
Rifled Trilobe HDN-60 (1.6) HDN-60 (3.2)	Different particle sizes	HGO/Cat. feed hydrotreating		Shaped ext.	~50	Alumina	NiO/MoO_3	✓
CSM-481 CSM-482		HGO thru resid		Shaped ext.	"P"	"P"	"P"	Licensees of Compagnie Francaise de Raffinage
CDM-152		"		"	"	"	"	"
UOP INC.								
RCD-5	Metals tolerance and HDS, activity	Atm. or vac. residua	LSFO, feedstock for cracking units & cokers	Sph.	41	Alumina	Co/Mo	Contact UOP
RCD-5A	High activity for HDS, moderate metals tolerance	"	"	Sph.	46	Alumina	Co/Mo	"
RCD-7	High activity for sulfur and Con. Carbon Removal	Demetallized oil, deasphalted residua	LSFO & Feed for cracking units	Cyl.	53	Alumina	Co/Mo	"
RCD-8	High metals tolerance, high demetallization activity, moderate HDS activity	Atm. or vac. residua, & deasphalted residua	LSFO & feeds for cracking units & cokers	Cyl.	36	"P"	"P"	"
RCD-9	High metals tolerance, high demetallization activity, high HDS activity	"	"	CYl.	37	"P"	"P"	"

Sulfur (elemental) recovery

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
ALCOA								
SRU ½ in. ⅜ in.	Active bed support, high physical strength	All claus plants.	High strength bed support and hold down with Claus activity	Sph.	50	Activated alumina	Activated alumina	✓

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
KAISER CHEMICALS								
S-301 3×6 ½×¼	High porosity, high activity, lowest attrition	H_2S and SO_2 conversion. Good COS, CS_2 conversion	Sulfur production	Sph.	45	Activated alumina	Activated alumina	✓
S-201 3×6, ½×¼	Standard high porosity alumina Claus	H_2S and SO_2 conversion Good COS and CS_2 conversion.	Sulfur production	Sph.	45	Activated alumina	Activated alumina	✓

Steam hydrocarbon reforming catalysts

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
DYCAT INTERNATIONAL								
Dycat 890	High activity steam reforming catalyst	Naphtha			68-70	Alpha-alumina	Ni, La	"
ICI CATALYSTS								
41-6	HDS	Gas/naphtha		Ext.	0.6 kg/l	Alumina	Co/Mo	✓
61-1	"	"		"	0.67 kg/l	"	Ni/Mo	✓
32-4	Sulfur removal	"		Sph.	1.08 kg/l	None	ZnO	✓
59-3	Chloride removal	"		"	0.85 kg/l	Alumina	Alkali	✓
46-1	Steam reforming	Naphtha		Ring	1.15 kg/l		Ni/K_2O	✓
46-4	"	"		"	1.0 kg/l	Ca/Al_2O_3	Ni	✓
57-3	"	Nat. gas, ref. off gas		"	1.0 kg/l	"	"	✓
25-3	"	Heavy gas		"	1.0 kg/l	"	Ni/K_2O	✓

Claus Unit tail gas treatment catalysts

Catalyst designation	Primary differentiating characteristics	Application (feedstock)	Application (product)	Form	Bulk density (compacted, lb/cu ft unless noted)	Carrier, support	Active agents	Availability to refiner by unrestricted sale: ✓, except where noted
KAISER CHEMICALS								
S-301 3×6 5×8	High porosity, low attrition	Sub-dewpoint Claus tail gas processes (i.e., CBA, Sulfreen, MCRC)		Sph.	45	Activated alumina	Activated alumina	✓
PROCATALYSE								
TG 103	Total hydrogenation of sulfur compounds into H_2S	Claus tail gas	H_2S	Sph.	0.5 g/cc	Alumina	CoMo	✓
TG 105	"	"	"	"	"	"	"	✓
S-234	Conversion of S compounds into into H_2S	"	"	Ext.	0.77 g/cc	Alumina	Co/Mo	✓

Other refining catalysts

	Purpose of catalyst	Application (feedstock)	Application (product)	Form (sphere ring, cylinder, etc.)	Bulk density	Carrier, support	Active agents	Availability unrestricted sale: ✓ except where noted.
ICI CATALYSTS								
32-4	Desulfurization of steam ref. feedstocks	Methane LPG naphtha ref. off gas	Sulfur-free hydrocarbons	Sph.	1.08 kg/l	None	ZnO	✓
75-1	Cold desulfurization of hydrocarbons	NG, LPG, naphtha, kerosine, H_2 off gas, catalytic reformer	Sulfur free hydrocarbons	Sph.	0.85 kg/l	None	ZnO	✓
59-3	HCl removal	NG, H_2 off gas, catalytic reformer	Chloride free hydrocarbons	Sph.	0.85 kg/l	Alumina	Activated alumina	✓
KALI-CHEMIE AG								
KC Perl-Kator series	Moving bed catalytic cracking in TCC and Houdriflow operation	Gas oil cracking		Beads which give-low attrition-high crush strengths		Silica/alumina	Acid sites	KC-Perlkator equivalent to Durabead manufactured under license of Mobil Oil Corp.
D11	High octane	HGO/VGO	High octane gasoline	"	"	"	Stabilized zeolites	✓
D12	High gasoline selectivity	"	High octane gasoline and low coke yields	"	"	"	"	✓
XP-catalyst	Xylenes-plus process	Transalkylation and disproportionation of toluene	Xylenes/benzene	"	"	"	Rare earth exchanged zeolites	ARCO process
Beadcat PK Series	Xylenes isomerization	o, m, p-xylene	m, p xylene	"	0.8 g/cc	"	Acid sites	✓

REFINING REPORT

Annual refining survey

Ailleen Cantrell
Director of Editorial Surveys

FOR a better understanding of the survey the following information may be of help.

Calendar-day figures reported in this survey are the average volume a refinery unit processes each day including downtime used for turnarounds. This is actual total volume for the year divided by 365.

Stream-day figures represent the amount a unit can process when running full capacity for short periods.

This survey includes only facilities charging whole crude, plus lube plants not charging whole crude.

Totals. The term NR means not reported. When this term appears in the crude columns, the totals reflect conversion to either a stream-day or calendar-day basis to make each column complete.

Crude conversion factor is 0.95.

In the case of catalytic cracking, if a recycle capacity was not reported, state totals will include a volume that is 30% of the fresh feed reported.

Legend. Hydrocracking includes those processes where 50% or more of the feed is reduced in molecular size; for hydrorefining 10% of the feed or less is reduced in molecular size; and for hydrotreating, essentially no reduction in molecular size of feed occurs.

Values for hydrogen volumes represent either generation or upgrading to 90+ % purity.

Cat reforming definitions are:

- Semiregenerative is characterized by shutdown to the reforming unit at specified intervals or at the operator's convenience for regeneration of catalyst in situ.
- Cyclic is characterized by continuous or continual regeneration of catalyst in situ in any one of several reactors that can be isolated from and returned to the reforming operation. This is accomplished without changing feed rate or octane.
- Other includes: Nonregenerative—catalyst replaced by fresh catalyst; continuous — continuous regeneration of a part of the catalyst in a special regenerator followed by continuous addition to the reactor; moving-bed catalyst systems.

Detailed U.S. breakdown by company, plant, and state starts next page. Included are:

- U.S. crude capacity and downstream production by states.
- Detailed U.S. survey.
- Inactive refineries.

Legend

Numbers identify processes in table

THERMAL PROCESSES
1. Gas-oil cracking
2. Thermal cracking
3. Visbreaking
4. Coking (fluid)
5. Coking (delayed)
6. Other

CAT CRACKING
1. Fluid
2. Other

CAT REFORMING
- Semiregenerative:
  1. Conventional catalyst
  2. Bimetallic catalyst
- Cyclic:
  3. Conventional catalyst
  4. Bimetallic catalyst
- Other:
  5. Conventional catalyst
  6. Bimetallic catalyst

CAT HYDROCRACKING
1. Distillate upgrading
2. Residual upgrading
3. Lube-oil manufacturing
4. Other

CAT HYDROREFINING
1. Residual desulfurizing
2. Heavy gas-oil desulfurizing
3. Cat-cracker and cycle-stock feed pretreatment
4. Middle distillate
5. Other

CAT HYDROTREATING
1. Pretreating cat-reformer feeds
2. Naphtha desulfurizing
3. Naphtha olefin or aromatics saturation
4. Straight-run distillate
5. Other distillate
6. Lube-oil "polishing"
7. Other

ALKYLATION
1. Sulfuric acid
2. Hydrofluoric acid

AROMATICS/ISOMERIZATION
1. BTX
2. Hydrodealkylation
3. Cyclohexane
4. C_4 feed
5. C_5 feed
6. C_5 and C_6 feed

HYDROGEN
1. Steam methane reforming
2. Steam naphtha reforming
3. Partial oxidation
4. Cryogenic
5. Other

NR – not reported

Survey of operating refineries in the U.S. (state capacities as of January 1, 1986)

		Crude capacity		Charge capacity, b/sd								Production capacity, b/sd					
						Cat cracking											
State	No. plants	b/cd	b/sd	Vacuum distillation	Thermal operations	Fresh feed	Recycle	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alkyla-tion	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
Alabama	2	124,500	128,900	34,000	10,000	......	......	27,000	......	28,000	28,500	......	7,000	......	10,500	8.0	400
Alaska	6	203,700	213,157	......	......	......	......	12,000	9,000	......	12,000	......	1,800	......	8,000	12.8	......
Arizona	1	5,000	5,263	1,500	......	......	......	......	......	......	......	......	......	......	1,000	......	......
Arkansas	4	64,170	67,200	34,425	......	18,500	775	9,000	......	......	18,000	4,400	......	6,100	11,500	2.8	......
California	30	2,338,993	2,459,317	1,325,265	493,050	595,500	65,400	524,800	366,000	438,000	826,380	105,100	15,200	26,100	73,154	950.9	19,040
Colorado	2	79,500	82,500	28,000	......	23,000	1,500	17,000	......	......	25,500	......	......	......	3,300	......	......
Delaware	1	140,000	150,000	95,000	44,000	60,000	15,000	53,000	19,000	......	110,000	8,000	3,370	......	......	40.0	2,180
Florida	1	17,500	19,000	10,000	......	......	......	......	......	......	......	......	......	......	......	......	......
Georgia	2	35,000	36,500	......	......	......	......	......	......	......	......	......	......	1,000	26,500	......	......
Hawaii	2	109,500	118,426	58,000	......	22,000	......	13,000	16,000	......	16,500	4,500	1,500	......	1,300	19.5	......
Illinois	7	914,600	917,000	334,150	132,700	340,000	35,600	292,900	66,500	35,000	478,100	84,600	17,300	5,350	36,500	64.3	6,175
Indiana	4	412,200	424,500	230,200	24,000	166,000	6,600	86,500	......	62,000	149,800	29,200	31,000	6,400	43,500	......	1,370
Kansas	6	311,700	352,383	101,000	51,000	110,000	9,000	84,600	3,190	40,000	127,100	30,500	13,969	2,500	4,000	......	2,070
Kentucky	2	218,900	226,300	90,000	57,600	100,000	......	53,500	......	40,000	30,300	12,000	17,400	8,600	30,000	20.0	......
Louisiana	17	2,244,633	2,339,658	880,300	383,300	796,100	42,300	474,500	139,700	248,500	874,600	164,400	56,200	35,300	55,500	162.6	13,558
Michigan	4	116,100	125,094	26,000	......	45,000	1,300	33,000	......	12,500	36,700	8,200	......	......	8,650	......	......
Minnesota	2	222,143	229,220	132,000	48,000	78,000	1,000	39,000	......	86,500	114,200	14,400	8,000	......	49,000	20.0	2,500
Mississippi	5	362,300	383,104	287,000	70,000	74,000	7,400	95,800	68,000	189,000	59,800	19,700	5,500	2,000	40,600	215.0	3,450
Montana	5	142,800	149,200	55,250	9,900	50,600	7,700	37,700	4,900	14,000	103,400	10,700	5,400	......	15,500	19.3	425
Nevada	1	4,500	4,700	2,500	......	......	......	......	......	......	......	......	......	......	......	......	......
New Jersey	6	415,000	441,368	235,400	34,500	251,000	37,000	86,500	......	65,500	250,500	21,000	41,000	8,500	73,000	11.0	975
New Mexico	3	66,375	69,500	6,000	......	27,400	2,375	17,300	......	......	29,600	3,200	......	......	3,500	......	......
North Dakota	2	62,800	65,400	......	......	26,000	5,200	12,000	......	1,200	16,200	3,000	4,000	......	......	......	......
Ohio	5	515,700	540,000	174,000	27,400	190,700	36,800	159,700	83,000	23,000	167,500	31,300	58,400	2,100	19,000	72.0	1,250
Oklahoma	5	374,000	390,131	131,500	27,800	133,500	12,400	97,000	5,000	26,000	133,000	34,900	12,000	9,500	18,300	10.0	1,040
Oregon	1	15,000	15,789	16,000	......	......	......	......	......	......	......	......	......	......	11,500	......	......
Pennsylvania	8	712,900	747,300	329,250	......	264,300	12,300	205,200	55,000	61,000	414,853	43,200	10,600	20,700	33,000	43.5	......
Tennessee	1	57,000	60,000	12,000	......	30,000	......	8,000	......	......	28,200	3,000	......	......	3,500	......	......
Texas	31	4,132,700	4,372,100	1,759,700	342,500	1,587,000	203,050	1,046,800	254,000	775,000	2,155,050	257,700	263,915	94,100	68,800	609.0	10,717
Utah	6	153,875	160,368	45,550	8,500	55,300	9,300	27,500	......	5,500	32,100	11,700	3,750	......	1,700	......	350
Virginia	1	51,000	53,000	29,000	13,500	27,500	2,000	8,750	......	......	24,500	......	......	......	......	......	825
Washington	7	429,850	447,543	219,254	61,000	91,500	23,000	107,800	50,000	25,000	160,500	24,600	2,900	......	19,000	80.0	3,080
West Virginia	2	16,500	17,000	8,175	......	......	......	4,400	......	......	4,800	......	......	5,000	......	1.2	......
Wisconsin	1	32,000	34,000	20,500	......	9,700	1,000	8,000	......	5,800	9,000	1,700	......	......	13,500	......	......
Wyoming	6	153,775	159,000	63,000	9,000	61,500	9,700	30,750	......	10,000	56,100	9,250	1,500	1,500	8,700	......	550
Total	**189**	**15,258,214**	**16,003,921**	**6,773,919**	**1,847,750**	**5,234,100**	**547,700**	**3,673,000**	**1,139,290**	**2,191,500**	**6,592,763**	**940,250**	**581,704**	**235,350**	**692,004**	**2,361.9**	**69,955**

U.S. refineries: location, capacities, types of processing

Company and location	Crude capacity b/cd	Crude capacity b/sd	Charge capacity, b/sd: Vacuum distillation	Thermal operations	Cat cracking Fresh feed	Cat cracking Recycle	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity, b/sd: Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
ALABAMA																
Hunt Refining Co.—Tuscaloosa	44,500	47,600	14,000	[5]10,000	......	......	[2]6,000	......	[2]9,000 [4]4,000	[1]6,000 [3]1,500	......	[6]1,000	......	10,500	[1]8.0	400
Louisiana Land & Exploration Co.—Saraland	80,000	81,300	20,000	......	......	......	[2]21,000	......	[2]15,000	[2]21,000	......	[6]6,000	......	......	......	......
Total	**124,500**	**128,900**	**34,000**	**10,000**	......	......	**27,000**	......	**28,000**	**28,500**	......	**7,000**	......	**10,500**	**8.0**	**400**
ALASKA																
Atlantic Richfield Co.—Kuparuk	12,000	12,000	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Prudhoe Bay	22,000	22,000	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Chevron U.S.A. Inc.—Kenai	22,000	NR	......	......	......	......	......	......	......	......	......	......	......	6,000	......	......
Mapco Petroleum Inc.—North Pole	70,000	70,000	......	......	......	......	......	......	......	......	......	[1]1,800	......	2,000	......	......
Petro Star Inc.—North Pole	NR	6,000	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Tesoro Petroleum Corp.—Kenai	72,000	80,000	......	......	......	......	[2]12,000	[2]9,000	......	[1]12,000	......	......	......	......	[1]12.8	......
Total	**203,700**	**213,157**	......	......	......	......	**12,000**	**9,000**	......	**12,000**	......	**1,800**	......	**8,000**	**12.8**	......
ARIZONA																
Intermountain Refining Cl—Fredonia	5,000	NR	1,500	......	......	......	......	......	......	......	......	......	......	1,000	......	......
Total	**5,000**	**5,263**	**1,500**	......	......	......	......	......	......	......	......	......	......	**1,000**	......	......
ARKANSAS																
Berry Petroleum Co.—Stevens	3,500	4,000	1,925	......	......	......	......	......	......	......	......	......	......	1,000	......	......
Cross Oil & Refining Co. of Arkansas—Smackover	6,800	7,200	4,000	......	......	......	......	......	......	[6]2,500	......	......	3,500	2,000	[1]2.8	......
Lion Oil Co.—El Dorado[1]	48,000	50,000	25,000	......	[1]18,500	775	[2]9,000	......	......	[1]10,000 [5]5,500	[1]4,400	......	......	6,500	......	......
Macmillan Ring-Free Oil Cl—Norphlet	5,870	6,000	3,500	......	......	......	......	......	......	......	......	......	2,600	2,000	......	......
Total	**64,170**	**67,200**	**34,425**	......	**18,500**	**775**	**9,000**	......	......	**18,000**	**4,400**	......	**6,100**	**11,500**	**2.8**	......

Solvent extraction: [1]5,500 b/d.

Company and location	Crude capacity b/cd	Crude capacity b/sd	Charge capacity, b/sd: Vacuum distillation	Thermal operations	Cat cracking Fresh feed	Cat cracking Recycle	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity, b/sd: Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
CALIFORNIA																
Anchor Refining Cl—McKittrick	10,000	11,000	7,000	......	......	......	......	......	......	......	......	......	......	......	......	......
Atlantic Richfield Co.—Carson	211,000	220,000	112,000	[5]54,000	[1]72,000	None	[2]45,000	[1]22,000	......	[1]40,000 [4]18,000 [7]16,000	[1]7,200 *2,400	......	......	......	[1]70.0	2,400
Beacon Oil Co.—Hanford	17,300	19,100	......	[1,3]350 [2,3]2,700	......	......	[2]3,600	......	......	......	......	......	......	......	......	......
Champlin Petroleum Co.—Wilmington	60,000	62,500	35,000	[5]24,000	[1]32,000	NR	[5]13,000	......	[3]38,000	[1]13,000	[2]10,000	[4]7,500	......	.....	......	1,200
Chevron U.S.A. Inc.—Bakersfield	26,000	NR	......	......	......	......	[2]6,000	......	......	[1]6,000	......	......	......	......	......	......
El Segundo	405,000	NR	179,000	[5]54,000	[1]60,000	None	[2]60,000	[1]43,000	[1]24,000 [2]60,000 [4]14,000	[1]56,000 [4]18,000	[1]8,000	[1]1,500	......	......	[2]112.0 [3]55.0	2,900
Richmond[1]	365,000	NR	226,000	......	[1]63,000	None	[2]84,000	[1]77,500 [2]30,000	[2]60,000 [4]65,000	[1]82,000 [5]18,200	[1]9,200	[4]2,000	11,700	11,000	[1]135.0	......
Conoco Inc.—Santa Maria	9,500	10,000	7,800	......	......	......	......	......	......	......	......	......	......	6,800	......	......

Company and location	Crude capacity b/cd	Crude capacity b/sd	Charge capacity, b/sd: Vacuum distillation	Thermal operations	Cat cracking Fresh feed	Cat cracking Recycle	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Production capacity, b/sd: Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
Edgington Oil Cl—Long Beach	41,600	44,730	21,165	......	......	......	......	......	......	......	......	......	......	15,554	......	......
Exxon Co.—Benicia	109,000	114,000	61,000	^{4}27,500	^{1}57,000	11,000	^{4}28,000	^{1}28,000	^{2}33,000	^{1}22,500 ^{2}20,000 ^{4}12,500 ^{5}12,500 ^{7}11,500	^{1}11,500	......	......	......	^{1}104.0	1,100
Fletcher Oil & Refining Co.—Carson	29,500	30,500	......	......	^{1}10,000	1,000	^{2}4,200	......	^{2}10,000	^{1}4,200	......	......	......	......	......	......
Golden Bear Division, Witco Chemical Corp.—Oildale	10,818	11,500	11,500	......	......	......	......	......	......	^{6}780	......	......	4,800	3,300	......	......
Golden West Refining Co.—Santa Fe Springs	40,600	42,300	25,000	^{3}13,800	^{1}13,500	None	^{2}19,000	^{1}11,000	......	^{1}12,000	^{2}3,000	......	......	4,000	^{1}11.0	......
Huntway Refining Co.—Benicia	8,400	9,000	7,500	......	......	......	......	......	......	......	......	......	......	4,500	......	......
Wilmington	5,500	6,000	5,000	......	......	......	......	......	......	......	......	......	......	3,500	......	......
Kern County Refinery Inc.—Bakersfield	21,400	23,000	......	^{2}7,000	......	......	^{2}3,000	......	......	^{1}3,000	......	......	......	......	......	......
Macmillan Ring-Free Oil Cl—Signal Hill	13,000	14,300	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Mobil Oil Corp.—Torrance	123,500	130,000	95,000	^{5}48,000	^{1}61,000	None	^{2}36,000	^{1}21,700	......	^{1}21,000 ^{3}16,000 ^{5}28,000	^{2}12,300	......	......	......	^{1}62.0	2,900
Newhall Refining Cl—Newhall	21,400	23,000	9,000	......	......	......	^{1}2,300	......	^{2}5,000	^{1}3,000	......	......	......	4,500	......	......
Oxnard Refinery—Oxnard	NR	4,500	......	......	......	......	......	......	......	......	......	......	......	3,000	......	......
Pacific Refining Co.—Hercules	55,000	NR	17,000	^{3}12,000	......	......	^{2}15,000	^{1}3,500	......	^{1}15,000	......	......	......	......	......	......
San Joaquin Refining Cl—Bakersfield	18,000	20,000	14,000	^{2}10,000	......	......	......	......	......	......	......	......	......	5,000	......	......
Shell Oil Co.—Martinez	113,500	117,000	82,500	^{4}22,000	^{1}60,000	NR	^{3}23,000	^{1}27,000	^{3}50,000	^{2}17,000 ^{3}15,000 ^{5}16,000 ^{6}6,300 ^{7}15,000	^{1}8,000	^{1}3,200	4,500	11,000	^{1}106.0	20
Wilmington	111,000	116,000	62,000	^{5}52,000	^{1}35,000	NR	^{2}24,000	......	......	^{2}27,000 ^{3}12,000 ^{5}34,000 ^{7}25,000	^{1}8,600	......	......	......	^{1}36.0	2,500
Superior Processing Co.—Santa Fe Springs	NR	46,000	22,000	^{5}10,000	^{1}12,000	300	^{2}8,500	^{1}7,800	^{2}11,000 ^{4}8,000	^{1}8,500 ^{7}5,900	^{2}2,400	^{4}1,000	......	1,000	^{1}17.5	550
Texaco Refining & Marketing Inc.—Bakersfield	38,000	42,000	22,000	......	......	......	^{2}6,500	......	^{2}15,000	^{1}6,500	......	......	......	......	......	......
Wilmington	75,000	78,400	42,000	^{5}48,000	^{1}28,000	8,000	^{3}35,000	^{1}20,000	......	^{1}18,000	^{1}4,400	......	......	......	^{3}48.0	1,650
Tosco Corp.—Martinez	126,000	132,600	105,000	^{4}37,000	^{1}45,000	None	^{2}8,700 ^{6}20,000	^{1}20,000	^{3}45,000	^{1}10,000 ^{2}24,500	^{1}10,500	......	......	......	^{1}75.0	1,200
Unocal Corp.—Los Angeles	108,000	111,000	83,000	^{3}20,000	^{1}47,000	7,000	^{2}52,000	^{1}22,000	......	^{1}54,000 ^{5}36,000	^{1}10,300	......	......	......	^{1}49.4	......
Rodeo	118,000	125,100	73,800	^{5}50,700	......	......	^{2}28,000	^{1}32,500	......	^{1}23,000 ^{5}9,500 ^{7}14,000	......	......	5,100	......	^{1}70.0	2,620
Total	**2,338,993**	**2,459,317**	**1,325,265**	**493,050**	**595,500**	**65,400**	**524,800**	**366,000**	**438,000**	**826,380**	**105,100**	**15,200**	**26,100**	**73,154**	**950.9**	**19,040**

Solvent extraction: ^{1}50,000 b/sd.

COLORADO

Company and location	Crude capacity b/cd	Crude capacity b/sd	Vacuum distillation	Thermal operations	Cat cracking Fresh feed	Cat cracking Recycle	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
Asamera Oil U.S. Inc.—Commerce City	NR	40,000	15,000	......	^{1}8,000	500	^{2}10,000	......	......	^{1}10,000	*1,600	......	......	......	......	......
Conoco Inc.—Commerce City	41,500	42,500	13,000	......	^{1}15,000	1,000	^{2}7,000	......	......	^{1}7,000 ^{4}8,500	*2,000	......	......	3,300	......	......
Total	**79,500**	**82,500**	**28,000**	......	**23,000**	**1,500**	**17,000**	......	......	**25,500**	......	......	......	**3,300**	......	......

Company and location	– Crude capacity –		Charge capacity, b/sd								Production capacity, b/sd					
					— Cat cracking —											
	b/cd	b/sd	Vacuum distillation	Thermal operations	Fresh feed	Recycle	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
DELAWARE																
Texaco Refining and Marketing Inc.—Delaware City	140,000	150,000	95,000	[4]44,000	[1]60,000	15,000	[2]18,000 [6]35,000	[4]19,000	......	[1]55,000 [4]55,000	[1]8,000 *5,500	[1]2,900 [2]470	......	......	[1]40.0	2,180
Total	**140,000**	**150,000**	**95,000**	**44,000**	**60,000**	**15,000**	**53,000**	**19,000**	......	**110,000**	**8,000**	**3,370**	......	......	**40.0**	**2,180**
FLORIDA																
Young Refining Co.—St. Marks	**17,500**	**19,000**	**10,000**	......	......	......	......	......	......	......	......	......	......	......	......	......
GEORGIA																
Amoco Oil Co.—Savannah	28,000	30,000	......	......	......	......	......	......	......	......	......	......	......	22,500	......	......
Young Refining Corp.—Douglasville	7,000	6,500	......	......	......	......	......	......	......	......	......	......	1,000	4,000	......	......
Total	**35,000**	**36,500**	......	......	......	......	......	......	......	......	......	......	**1,000**	**26,500**	......	......
HAWAII																
Chevron U.S.A. Inc.—Barber's Point	48,000	NR	28,000	......	[1]22,000	None	......	......	......	[3]3,500	[1]4,500	[4]1,500	......	1,300	[1]2.5	......
Hawaiian Independent Refinery Inc.—Ewa Beach	61,500	67,900	30,000	......	......	......	[1]13,000	[1]16,000	......	[1]13,000	.....	.....	.....	.....	[1]17.0	.....
Total	**109,500**	**118,426**	**58,000**	......	**22,000**	......	**13,000**	**16,000**	......	**16,500**	**4,300**	**1,500**	......	**1,300**	**19.5**	......
ILLINOIS																
Calumet Industries Inc.—Burnham	...	...	750	......	......	......	......	......	......	.....	......	......	750	......	......	......
Clark Oil & Refining Corp.—Blue Island	64,600	68,000	......	[1]27,000	[1]25,000	1,000	[2]30,500	[1]11,000	......	[1]20,500	[2]6,000	......	......	4,500	......	......
Hartford	60,000	65,000	18,000	[5]14,500	[1]27,000	1,000	[2]12,000	......	......	[1]12,000 [4]12,000	[2]8,000	......	......	......	......	750
Marathon Petroleum Co.—Robinson	195,000	205,000	62,000	[3]4,000 [5]24,000	[1]38,000	400	[1]12,400 [4]35,000 [6]30,000	[1]22,000	[5]6,000	[1]22,000	[2]7,600	[6]10,000	......	.....	[1]25.0	1,200
Mobil Oil Corp.—Joliet	180,000	200,000	88,000	[5]35,000	[1]98,000	None	[2]46,000	......	......	[1]72,000 [2]9,000 [5]75,000	[2]25,000	......	......	......	......	2,225
Shell Oil Co.—Wood River	264,000	276,000	105,500	......	[1]94,000	NR	[2]22,000 [3]75,000	[1]33,500	[3]29,000	[2]64,000 [5]52,500 [6]7,000 [7]35,000	[1]22,000	[1]3,800	4,600	28,500	[1]28.3	......
Unocal Corp.—Lemont	151,000	157,000	59,900	[5]28,200	[1]58,000	5,000	[2]30,000	.....	......	[1]30,000 [2]14,000 [3]8,000 [5]39,000 [7]1,800 [7]4,300	[2]16,000	[1]3,500	......	3,500	[1]11.0	2,000
Total	**914,600**	**917,000**	**334,150**	**132,700**	**340,000**	**35,600**	**292,900**	**66,500**	**35,000**	**478,100**	**84,600**	**17,300**	**5,350**	**36,500**	**64.3**	**6,175**
INDIANA																
Amoco Oil Co.—Whiting	350,000	360,000	203,000	[5]24,000	[1]140,000	4,000	[3]75,000	.....	[3]62,000	[1]87,000 [5]42,000 [6]4,300	[1]23,000	[1]13,000 [6]18,000	6,400	40,000	......	1,370
Indiana Farm Bureau Cooperative Association Inc.—Mt. Vernon	20,600	21,500	7,200	......	[1]7,000	NR	[4]3,500	......	......	[2]3,500	[2]1,700	......	......	......	......	......

Company and location	– Crude capacity –		Charge capacity, b/sd								Production capacity, b/sd					
	b/cd	b/sd	Vacuum distillation	Thermal operations	— Cat cracking —		Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
					Fresh feed	Recycle										
Rock Island Refining Corp.—Indianapolis[1]	32,100	33,000	15,000	......	^{1}19,000	500	^{2}8,000	......	......	^{1}13,000	^{2}4,500	......	......	......	......	......
Young Refining Corp.—Laketon	9,500	10,000	5,000	......	......	......	......	......	......	......	......	......	......	3,500	......	......
Total	**412,200**	**424,500**	**230,200**	**24,000**	**166,000**	**6,600**	**86,500**	......	**62,000**	**149,800**	**29,200**	**31,000**	**6,400**	**43,500**	......	**1,370**
Solvent extraction: ^{1}4,500.																
KANSAS																
Derby Refining Co.—Wichita	28,800	30,000	10,000	^{5}5,000	^{1}17,000	2,500	^{2}7,000	......	......	^{1}7,000	^{1}3,000 *1,500	......	......	......	......	210
Farmland Industries Inc.—Coffeyville	56,500	60,723	19,500	^{5}12,000	^{1}23,000	1,500	^{2}16,000	......	......	^{1}26,500	^{2}6,000	......	2,500	......	......	600
Phillipsburg	26,400	27,460	10,000	......	......	......	^{1}5,300	......	......	^{1}7,500	......	......	......	2,000	......	......
National Cooperative Refinery Association—McPherson	70,000	73,000	27,000	^{5}22,000	^{1}20,000	1,000	^{2}15,000	......	......	^{1}10,000 ^{2}14,000 ^{5}13,000	^{2}6,000	^{4}2,000 ^{6}9,000	......	......	......	650
Texaco Refining & Marketing Inc.—El Dorado	80,000	82,000	27,000	^{5}12,000	^{1}32,000	4,000	^{2}25,000	......	^{3}40,000	^{1}28,000 ^{2}4,800	^{2}10,000	^{1}2,969	......	......	......	610
Total Petroleum Inc.—Arkansas City	50,000	52,200	7,500	......	^{1}18,000	None	^{2}16,300	^{1}3,190	......	^{1}16,300	^{2}5,500	......	......	2,000	......	......
Total	**311,700**	**325,383**	**101,000**	**51,000**	**110,000**	**9,000**	**84,600**	**3,190**	**40,000**	**127,100**	**30,500**	**13,969**	**2,500**	**4,000**	......	**2,070**
KENTUCKY																
Ashland Petroleum Co.—Catlettsburg[1]	213,400	220,000	90,000	^{2}2,600 †^{6}55,000	^{1}60,000 §40,000	......	^{2}25,500 ^{6}27,000	......	^{3}40,000	^{1}60,000 ^{2}6,000 ^{3}6,000 ^{4}40,000 ^{7}5,000 ^{7}12,000	^{2}12,000 *1,000	^{1}5,400 ^{6}12,000	8,600	30,000	^{1}20.0	......
Somerset Refinery Inc.—Somerset	5,500	6,300	......	......	......	......	^{4}1,000	......	......	^{1}1,300	......	......	......	......	......	......
Total	**218,900**	**226,300**	**90,000**	**57,600**	**100,000**	......	**53,500**	......	**40,000**	**130,300**	**12,000**	**17,400**	**8,600**	**30,000**	**20.0**	......
Solvent extraction: ^{1}10,000 b/sd. †ART. §Reduced crude converter.																
LOUISIANA																
Atlas Processing Co., Division of Pennzoil—Shreveport[1]	46,200	50,000	24,300	......	......	......	^{2}10,000	......	......	^{1}10,000 ^{6}3,400 ^{7}1,200 ^{7}5,500	......	......	8,500	600	^{1}6.1	......
BP Oil Inc.—Belle Chasse	199,100	205,000	73,000	^{5}20,000	^{1}89,000	2,300	^{2}40,000	......	......	^{2}42,000 ^{4}24,000 ^{1}2,000	^{2}28,400	^{1}24,000 ^{3}6,300	......	......	......	845
Calcasieu Refining Co.—Lake Charles	12,150	13,500	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Calumet Refining Co.—Princeton	4,100	4,400	8,000	......	......	......	......	......	......	......	......	......	3,000	1,000	......	......
Canal Refining Co.—Church Point	7,858	7,858	......	......	......	......	^{1}1,600	......	......	......	......	......	......	......	......	......
Citgo Petroleum Corp.—Lake Charles	320,000	330,000	83,000	^{5}63,000	^{1}150,000	None	^{2}46,000 ^{5}45,000	^{1}35,000	^{3}30,000	^{1}91,000 ^{4}24,000	23,000	^{1}2,300	7,000	......	......	3,000
Claiborne Gasoline Co.—Lisbon	NR	7,500	......	......	......	......	^{2}2,000	......	......	......	......	^{6}1,500	......	......	......	......

Company and location	Crude capacity		Charge capacity, b/sd								Production capacity, b/sd					
	b/cd	b/sd	Vacuum distillation	Thermal operations	Cat cracking Fresh feed	Cat cracking Recycle	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
Conoco Inc.—Lake Charles	156,500	164,000	63,000	^{2}12,000 ^{5}48,800	^{1}30,600	None	~~^{2}15,400~~ ^{4}12,000	......	......	^{1}33,000 ^{4}44,000 ^{5}44,000 ^{7}13,500	^{1}6,000 *2,100	......	......	......	......	3,160
Cotton Valley Refinery (Kerr-McGee Refining Corp.)—Cotton Valley	7,800	8,500	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Exxon Co.—Baton Rouge[2]	455,000	474,000	205,000	^{5}76,000	^{1}155,000	None	^{4}95,000	^{1}24,000	......	^{1}95,000 ^{3}2,500 ^{5}55,000 ^{6}17,000 ^{7}2,000	^{1}29,800 *8,000	......	17,400	28,900	......	4,003
Hill Petroleum Co.—Krotz Springs	55,300	57,500	24,000	......	^{1}28,000	None	^{2}12,500	......	......	^{1}12,500	......	......	......	......	......	......
Marathon Petroleum Co.—Garyville	255,000	263,000	125,000	......	^{1}75,000	14,000	^{6}50,000	......	^{2}58,000 ^{4}35,500	^{1}45,000	^{2}20,000	^{4}15,100	......	25,000	......	......
Murphy Oil USA Inc.—Meraux[3]	92,500	95,400	40,000	......	^{1}35,000	2,500	^{6}23,000	......	......	^{1}29,000 ^{4}15,000	^{1}8,700	......	......	......	......	......
Placid Refining Co.—Port Allen[4]	46,000	50,000	20,000	......	^{1}18,500	1,500	^{2}7,000	......	......	^{1}7,000	^{2}3,500	......	......	......	......	......
Shell Oil Co.—Norco	218,000	225,000	78,000	^{5}21,000 ^{6}17,700 ^{6}85,800	^{1}100,000	2,000	^{3}30,000	^{1}27,700	^{3}70,000	^{2}29,000 ^{3}28,000	^{1}13,500 *10,000	......	......	......	^{1}70.0	1,000
Tenneco Oil Co.—Chalmette	137,000	144,000	62,000	^{5}27,000	^{1}45,000	None	^{2}27,000 ^{5}18,000	^{1}18,000	^{3}35,000 ^{4}20,000	^{1}38,000	^{2}19,000	^{1}7,000	......	......	^{1}24.0	1,550
Texaco Refining & Marketing Inc.—Convent	225,000	240,000	75,000	^{3}12,000	^{1}70,000	20,000	^{2}40,000	^{2}35,000	......	^{1}40,000 ^{4}37,000 ^{5}65,000	^{1}12,500	......	......	......	^{3}62.5	......
Total	**2,244,633**	**2,339,658**	**880,300**	**383,300**	**796,100**	**42,300**	**474,500**	**139,700**	**248,500**	**874,600**	**164,400**	**56,200**	**35,900**	**55,500**	**162.6**	**13,558**

Solvent extraction: ^{1}7,100 b/sd. ^{2}6,900 b/sd. ^{3}12,000 b/sd. ^{4}5,000 b/sd.

MICHIGAN

Company and location	Crude capacity b/cd	Crude capacity b/sd	Vacuum distillation	Thermal operations	Cat cracking Fresh feed	Cat cracking Recycle	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
Crystal Refining Co.—Carson City	4,000	6,200	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Lakeside Refining Co.—Kalamazoo	5,600	NR	......	......	......	......	^{1}2,000	......	......	......	......	......	......	......	......	......
Marathon Petroleum Co.—Detroit	68,500	71,000	26,000	......	^{1}27,000	1,300	^{2}17,000	......	^{3}12,500	^{1}17,500	^{1}4,000	......	......	8,650	......	......
Total Petroleum Inc.—Alma	40,000	42,000	......	......	^{1}18,000	None	^{2}14,000	......	......	^{1}14,000 ^{4}1,400 ^{7}3,800	^{2}4,200 †1,000	......	......	......	......	......
Total	**118,100**	**125,094**	**26,000**	......	**45,000**	**1,300**	**33,000**	......	**12,500**	**36,700**	**8,200**	......	......	**8,650**	......	......

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†Dimersol.

MINNESOTA

Company and location	Crude capacity b/cd	Crude capacity b/sd	Vacuum distillation	Thermal operations	Cat cracking Fresh feed	Cat cracking Recycle	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
Ashland Petroleum Co.—St. Paul Park	67,143	69,220	32,000	......	^{1}23,000	......	^{2}13,000	......	^{3}23,000	^{1}13,000 ^{4}7,200 ^{7}8,000	^{2}5,900 *350	^{6}8,000	......	14,000	......	......
Koch Refining Co.—Rosemount	155,000	160,000	100,000	^{5}48,000	^{1}55,000	1,000	^{6}26,000	......	^{3}63,500	^{1}26,000 ^{4}46,000 ^{5}14,000	^{1}8,500 *1,100 †3,700	......	......	35,000	^{2}20.0	2,500
Total	**222,143**	**229,220**	**132,000**	**48,000**	**78,000**	**1,000**	**39,000**	......	**86,500**	**114,200**	**14,400**	**8,000**	......	**49,000**	**20.0**	**2,500**

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†Dimersol.

	Crude capacity		Charge capacity, b/sd								Production capacity, b/sd					
Company and location	b/cd	b/sd	Vacuum distillation	Thermal operations	Cat cracking Fresh feed	Cat cracking Recycle	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
MISSISSIPPI																
Amerada-Hess Corp.—Purvis	30,000	NR	20,000	^{4}8,000	^{2}18,000	NR	^{2}5,800	......	......	^{2}5,800 ^{4}6,000	^{1}3,500	......	......	......	......	250
Chevron U.S.A. Inc.—Pascagoula	295,000	NR	243,000	^{5}62,000	^{1}56,000	2,000	^{2}90,000	^{1}68,000	^{1}96,000 ^{3}63,000 ^{4}30,000	^{1}48,000	^{1}16,200	^{1}5,500	......	20,000	^{1}215.0	3,200
Ergon Refining Inc.—Vicksburg	20,500	22,000	17,000	......	......	......	......	......	......	......	......	......	2,000	12,000	......	......
Southland Oil Co.—Lumberton	5,800	6,500	......	......	......	......	......	......	......	......	......	......	......	3,500	......	......
Sandersville	11,000	12,500	7,000	......	......	......	......	......	......	......	......	......	......	5,100	......	......
Total	**362,300**	**383,104**	**287,000**	**70,000**	**74,000**	**7,400**	**95,800**	**68,000**	**189,000**	**59,800**	**19,700**	**5,500**	**2,000**	**40,600**	**215.0**	**3,450**
MONTANA																
Cenex—Laurel[1]	40,400	42,500	14,000	......	^{1}12,000	3,000	^{2}12,000	......	^{4}14,000	^{1}15,000	^{2}3,000	^{4}2,000	......	6,000	......	......
Conoco Inc.—Billings[2]	48,500	50,000	20,000	......	^{1}15,500	1,000	^{2}12,500	......	......	^{4}38,000 ^{5}3,500	^{2}5,000	^{4}3,400	......	6,500	......	......
Exxon Co.—Billings	42,000	44,000	18,000	^{4}7,500	^{1}21,000	3,500	^{1}10,000	^{1}4,900	......	^{1,2}15,500 ^{4}10,000 ^{5}10,000 ^{7}6,000	^{2}2,700	......	......	3,000	^{5}19.3	425
Flying J Inc.—Cut Bank	5,600	6,200	......	^{2}2,400	......	......	^{2}2,200	......	......	^{1}2,200 ^{4}1,000	*500	......	......	......	......	......
Montana Refining Co.—Great Falls	6,300	6,500	3,250	......	^{1}2,100	200	^{2}1,000	......	......	^{1}1,000 ^{5}1,200	*350	......	......	......	......	......
Total	**142,800**	**149,200**	**55,250**	**9,900**	**50,600**	**7,700**	**37,700**	**4,900**	**14,000**	**103,400**	**10,700**	**5,400**	......	**15,500**	**19.3**	**425**
NEVADA																
Nevada Refining Co.—Tonopah	**4,500**	**4,700**	**2,500**	......	......	......	......	......	......	......	......	......	......	......	......	......
NEW JERSEY																
Amerada-Hess Corp.—Port Reading	......	......	......	......	^{1}55,000	None	......	......	......		^{1}4,500 *5,000	......	......	......	......	......
Chevron U.S.A. Inc.—Perth Amboy	80,000	85,000	46,000	......	......	......	......	......	......	......	......	......	......	35,000	......	......
Coastal Eagle Point Oil Co.—Westville	90,000	95,000	31,000	^{3}13,000	^{1}40,000	12,000	^{2}38,000	......	......	^{1}43,000 ^{4}30,000	^{1}3,000 *2,500	^{1}10,000 ^{2}6,000	......	......	......	......
Exxon Co.—Linden	100,000	110,000	66,000	......	^{1}120,000	25,000	^{4}25,000	......	^{2}50,000	^{1}28,000 ^{2}19,000 ^{5}65,000	^{1}8,500	^{6}25,000	......	38,000	......	......
Mobil Oil Corp.—Paulsboro	100,000	104,000	62,400	^{5}21,500	^{1}36,000	None	^{2}23,500	......	^{5}15,000	^{1}23,500 ^{5}42,000	^{2}5,000	......	8,500	......	^{1}11.0	975
Seaview Petroleum Inc.—Thorofare	45,000	NR	30,000	......	......	......	......	......	......	......	......	......	......	......	......	......
Total	**415,000**	**441,368**	**235,400**	**34,500**	**251,000**	**37,000**	**86,500**	......	**65,000**	**250,[illegible]00**	**21,000**	**41,000**	**8,500**	**73,000**	**11.0**	**975**
NEW MEXICO																
Bloomfield Refining Co.—Bloomfield	13,700	14,000	......	......	^{1}5,400	500	^{2}2,800	......	......	^{2}2,800	......	......	......	......	......	......
Giant Industries Inc.—Gallup	18,000	19,000	......	......	^{1}7,500	375	^{2}6,800	......	......	^{2}6,800	^{2}1,400	......	......	......	......	......
Navajo Refining Co.—Artesia	NR	36,500	6,000	......	^{1}14,500	1,500	^{1}1,700 ^{2}6,000	......	......	^{1}10,000 ^{4}3,500 ^{5}6,500	^{2}1,800	......	......	3,500	......	......
Total	**66,375**	**69,500**	**6,000**	......	**27,400**	**2,375**	**17,300**	......	......	**29,600**	**3,200**	......	......	**3,500**	......	......

Solvent extraction: [1]4,000 b/sd. [2]8,500 b/sd (PDA).

Company and location	– Crude capacity – b/cd	b/sd	Charge capacity, b/sd Vacuum distillation	Thermal operations	— Cat cracking — Fresh feed	Recycle	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity, b/sd Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
NORTH DAKOTA																
Amoco Oil Co.—Mandan	58,000	60,000	......	......	[1]26,000	5,200	[4]10,000	......	......	[2]15,000	[2]3,000 *1,700	[6]4,000	......	......	......	......
Flying J Inc.—Williston	4,800	5,400	......	......	......	......	[2]2,000	......	[4]1,200	[1]1,200	......	......	......	......	......	......
Total	**62,800**	**65,400**	......	......	**26,000**	**5,200**	**12,000**	......	**1,200**	**16,200**	**3,000**	**4,000**	......	......	......	......
OHIO																
Ashland Petroleum Co.—Canton	66,000	68,000	33,000	......	[1]25,000	NR	[6]20,000	......	[3]23,000	[1]20,000 [4]7,000	[2]7,000 *500	......	......	12,000	......	......
Chevron U.S.A. Inc.—Cincinnati	43,700	45,000	......	......	[1]18,000	2,000	[2]11,000	......	......	[2]11,000 [4]6,000	[2]6,000	......	......	......	......	......
Standard Oil Co. of Ohio—Lima	168,000	177,000	51,000	[5]16,200	[1]37,700	7,800	[4]47,000	[4]20,000	......	[1]59,000	......	[1]24,400 [2]6,500 [6]16,600	2,100	......	......	620
Toledo	120,000	126,000	68,000	[5]11,200	[1]55,000	16,500	[3]23,000 [4]17,700	[4]35,000	......	[1]37,000	[1]11,300	......	......	7,000	[1]24.0	630
Sun Cl-Toledo[1]	118,000	124,000	22,000	......	[1]55,000	3,000	[2]41,000	[1]28,000	......	[1]27,500	[1]7,000	[1]8,500 [2]2,400	......	......	[1]48.0	......
Total	**515,700**	**540,000**	**174,000**	**27,400**	**190,700**	**36,800**	**159,700**	**83,000**	**23,000**	**167,500**	**31,300**	**58,400**	**2,100**	**19,000**	**72.0**	**1,250**
Solvent extraction: [1]11,000 b/sd.																
OKLAHOMA																
Conoco Inc.—Ponca City	134,000	138,000	40,000	[5]20,500	[1]45,000	None	[2]33,500	......	......	[1]33,500 [5]24,000	[2]12,000 *2,100	[4]4,500	2,000	......	......	740
Kerr-McGee Refining Corp.—Wynnewood[1]	43,000	45,000	13,000	......	[1]20,000	NR	[2]8,500	[1]5,000	[2]6,000	[1]9,000	[2]5,000	......	......	5,000	[1]10.0	......
Sinclair Oil Corp.—Tulsa	50,000	NR	15,000	......	[1]18,000	5,000	[2]20,000	......	......	[1]20,000	[1]3,000	[4]500	......	2,500	......	......
Sun Cl—Tulsa	85,000	90,000	31,500	[5]7,300	[1]28,000	1,400	[2]23,000	......	......	[1]24,000 [6]10,500	[1]2,400 [2]6,000	[1]2,000 [2]1,200 [3]1,500 [4]2,300	7,500	4,800	......	300
Total Petroleum Inc.—Ardmore	62,000	64,500	32,000	......	[1]22,500	None	[6]12,000	......	[3]20,000	[1]12,000	[2]6,500	......	......	6,000	......	......
Total	**374,000**	**390,131**	**131,500**	**27,800**	**133,500**	**12,400**	**97,000**	**5,000**	**26,000**	**133,000**	**34,900**	**12,000**	**9,500**	**18,300**	**10.0**	**1,040**
Solvent extraction: [1]5,000 b/sd.																
OREGON																
Chevron U.S.A. Inc.—Portland	**15,000**	**15,789**	**16,000**	......	......	......	......	......	......	......	......	......	......	**11,500**	......	......
PENNSYLVANIA																
Atlantic Refining & Marketing Corp.—Philadelphia	125,000	130,000	83,000	......	[1]29,000	None	[2]60,000	[4]30,000	......	[1]50,000 [4]54,000 [7]24,000	......	......	......	25,000	[5]40.0	......
BP Oil Inc.—Marcus Hook	168,000	177,000	85,000	......	[1]48,000	1,600	[6]50,000	[4]25,000	[3]48,000	[1]64,000 [4]20,000 [5]21,000	[2]8,200	......	......	......	......	......
Chevron U.S.A. Inc.—Philadelphia	174,100	180,000	80,000	......	[1]85,300	6,500	[2]34,000	......	......	[2]34,000 [4]30,000	[2]20,000	[1]4,000 [2]1,300	......	......	......	......

			Charge capacity, b/sd								Production capacity, b/sd					
	Crude capacity		Vacuum distillation	Thermal operations	Cat cracking		Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
Company and location	b/cd	b/sd			Fresh feed	Recycle										
Kendall-Amalie Division, Witco Chemical Co.—Bradford	8,600	10,000	......	......	......	......	......	......	......	^{1}2,553	......	......	3,950	......	......	......
Pennzoil Products Co.—Rouseville	15,700	16,500	6,500	......	......	......	^{2}3,600	......	......	^{1}4,500 ^{6}7,800	......	......	4,750	......	^{1}3.5	......
Quaker State Oil Refining Corp—Farmers Valley	6,500	6,800	2,750	......	......	......	^{2}2,000	......	......	^{1}2,300	......	......	2,000	......	......	......
Sun Cl—Marcus Hook	155,000	165,000	46,000	......	^{1}82,000	4,000	^{2}39,600	......	^{3}13,000	^{1}54,300 ^{4}14,400 ^{6}6,000	^{1}12,000	^{1}5,300	10,000	......	......	......
United Refining Co.—Warren	60,000	62,000	26,000	......	^{1}20,000	200	^{2}16,000	......	......	^{1}20,000 ^{4}6,000	^{1}3,000 *2,200	......	......	8,000	......	......
Total	**712,900**	**747,300**	**329,250**	......	**264,300**	**12,300**	**205,200**	**55,000**	**61,000**	**414,853**	**43,200**	**10,600**	**20,700**	**33,000**	**43.5**	......
TENNESSEE																
Mapco Petroleum Inc.—Memphis	NR	60,000	12,000	......	^{1}30,000	None	^{2}8,000	......	......	^{1}8,000 ^{2}4,200 ^{5}16,000	^{2}3,000 *2,500	......	......	3,500	......	......
Total	**57,000**	**60,000**	**12,000**	......	**30,000**	......	**8,000**	......	......	**28,200**	**3,000**	......	......	**3,500**	......	......
TEXAS																
Amber Refining Co.—Fort Worth	14,500	15,000	3,500	......	^{1}4,500	2,500	^{1}1,700 ^{2}3,800	......	......	^{1}6,500	*600	......	......	......	......	......
American Petrofina Inc.—Port Arthur	90,000	110,000	40,000	^{3}13,000	^{1}34,000	2,000	^{2}20,000	......	^{4}37,000	^{1}25,000	^{1}2,800	^{1}2,300 ^{2}1,600	......	......	......	......
Amoco Oil Co.—Texas City	400,000	415,000	195,000	^{5}37,000	^{1}194,000	43,000	^{4}131,000	^{1}53,000 ^{2}60,000	^{3}58,000	^{1}136,000 ^{5}48,000	^{1}23,000	^{1}45,000 ^{6}22,000	......	......	^{1}180.0	2,000
Atlantic Richfield Co.—Houston	278,000	290,000	135,000	^{5}39,000	^{1}78,000	None	^{2}68,000	......	^{3}46,000 ^{4}89,000	^{1}68,000 ^{2}9,000 ^{3}37,000 ^{6}6,000 ^{7}600	^{1}9,000	^{1}11,600	6,400	......	......	2,400
Champlin Petroleum Co.—Corpus Christi[1]	170,000	175,000	77,000	^{5}25,000	^{1}69,000	NR	^{5}50,000	......	^{3}58,000 ^{4}32,000	^{1}52,000	^{2}17,600 *1,600	^{1}2,500 ^{3}1,500	......	......	......	1,250
Charter International Oil Co.—Houston[2]	NR	70,000	27,000	^{3}7,500	^{1}50,000	NR	^{2}13,500	......	......	^{1}15,000 ^{4}22,500 ^{7}7,500	^{1}5,000	^{1}2,100	......	5,000	......	......
Chevron U.S.A. Inc.—El Paso	76,000	NR	54,000	......	^{1}22,000	None	^{2}25,000	......	^{4}18,000	^{1}25,000	^{1}5,500	^{4}3,000	......	5,500	......	......
Port Arthur	406,900	418,000	203,200	^{5}34,000	^{1}110,000	6,000	^{2}23,000 ^{4}44,100	......	......	^{2}67,100 ^{4}138,000 ^{6}13,900	^{2}16,900	^{1}4,595 ^{2}2,905 ^{3}2,500 ^{5}7,200	13,200	......	......	1,840
Coastal States Petroleum Co.—Corpus Christi	95,000	NR	53,000	^{3}13,500 ^{5}12,000	^{1}19,500	1,100	^{5}20,000	^{1}10,000	......	^{1}25,000 ^{4}20,000 ^{6}25,000	^{2}2,800	^{1}11,000 ^{2}7,000	......	10,000	^{1}24.0 ^{4}15.0	650
Crown Central Petroleum Corp.—Houston	100,000	105,000	40,000	^{4}12,500	^{1}56,000	NR	^{2}14,000 ^{5}22,000	......	^{4}10,000	^{1}26,000	^{2}13,000	^{1}2,000 ^{2}2,000	......	......	......	350
Diamond Shamrock Corp.—Sunray[3]	85,000	88,000	47,000	......	^{1}45,000	None	^{2}16,000	......	......	^{1}18,000	^{1}8,700 *4,600	^{4}1,400	......	3,500	......	......
Three Rivers[4]	45,000	47,500	20,000	......	^{1}17,000	None	^{2}8,000	......	......	^{1}9,000	^{2}6,000	......	1,000	......	......	......
Exxon Co. U.S.A.—Baytown[5]	494,000	525,000	208,000	......	^{1}155,000	15,000	^{4}123,000	^{1}19,000	^{1}71,000 ^{3}85,000	^{1}139,000 ^{3}23,500 ^{4}143,000 ^{5}40,000 ^{6}44,100	^{1}29,000	......	36,300	7,000	^{1}85.0	......

Company and location	Crude capacity		Charge capacity, b/sd								Production capacity, b/sd				Hydrogen (MMcfd)	Coke (t/d)
	b/cd	b/sd	Vacuum distillation	Thermal operations	Cat cracking		Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt		
					Fresh feed	Recycle										
Fina Oil & Chemical Co. (subsidiary of American Petrofina)—Big Spring	NR	60,000	22,000	[3]3,500	[1]23,500	None	[2]20,000	......	......	[1]22,000 [4]14,500 [5]3,000	[2]6,000	......	......	6,500	......	......
Howell Hydrocarbons Inc.—San Antonio	9,900	10,000	......	......	......	......	[1]1,200	......	......	......	......	......	......	......	......	......
Koch Refining Co.—Corpus Christi	125,000	130,000	40,000	[4]12,000	[1]40,000	800	[1]12,000 [3]15,000	......	......	[1]28,000 [5]8,000	[2]8,400	[1]7,600 [2]2,500	......	......	......	375
LaGloria Oil & Gas Co.—Tyler	65,000	70,000	16,000	[5]8,000	[1]17,000	850	[2]35,000 [5]11,700	......	......	[2]20,800	[1]4,800	......	......	......	......	300
Liquid Energy Corp.—Bridgeport	10,000	10,800	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Marathon Petroleum Co.—Texas City	69,500	72,000	28,000	......	[1]38,000	1,000	[1]8,000	......	......	......	[2]11,000	[1]2,500	......	......	......	......
Mobil Oil Corp.—Beaumont	270,000	285,000	86,000	[5]29,500	[1]102,000	None	[2]103,000	[1]32,000	......	[1]92,000 [5]116,000 [6]3,500 [7]2,150	[1]13,000	[5]20,000	8,300	......	[1]60.0	1,352
Phillips 66 Co.—Borger	100,000	105,000	......	......	[1]60,000	10,400	[2]26,000	......	[1]50,000	[2]26,500 [4]27,400 [5]12,600	[2]14,000	[3]3,060 [4]8,100 [5]12,100 [6]12,500	......	......	[1]50.0	......
Sweeny	175,000	195,000	83,000	......	[1]87,000	7,700	[2]36,000	......	[1]75,000	[2]53,000 [4]50,000	[2]10,500	[1]5,575 [3]7,630 [5]9,100 [6]7,800	......	......	[4]80.0	......
Pride Refining Inc.—Abilene	42,750	45,000	12,000	......	......	......	......	......	......	......	......	......	......	......	......	......
Shell Oil Co.—Deer Park	228,500	240,000	77,000	[1]55,000 [6]18,000	[1]60,000	10,000	[2]15,000 [3]40,000	[4]65,000	[3]45,000	[2]65,000 [3]37,500 [6]10,000 [7]82,500	[1]7,800	[1]19,100	10,000	4,900	[1]65.0	......
Odessa	28,600	29,500	10,000	......	[1]11,500	NR	[1]11,000	......	......	[2]11,000	[1]3,000	[1]350	......	......	......	
Southwestern Refining Cl—Corpus Christi	104,000	108,000	36,000	......	[1]50,000	None	[2]30,000	......	[2]18,000	[1]40,000 [4]27,000	[2]4,000 *§4,200	[1]6,500	......	......	......	......
Texaco Refining & Marketing Inc.—																
El Paso	17,000	18,000	......	[5]4,000	[1]7,000	2,000	[2]4,800	......	......	[1]4,800	[1]1,500 *500	[4]500	......	......	......	100
Port Arthur[6] and Port Neches	250,000	278,000	126,000	......	[1]105,000	31,500	[6]40,000	[1]15,000	......	[1]40,000 [4]65,000 [6]18,500	[1]9,000	......	15,800	14,000	......	......
Texas City Refining Inc.—Texas City	119,600	130,000	54,000	[3]19,000	[1]40,000	None	[1]11,000 [5]12,000	......	[4]29,000	[1]23,000	[2]6,200	......	......	......	......	......
Unocal Corp.—(Beaumnont), Nederland	120,000	126,300	43,000	......	[1]39,000	4,000	[3]12,000 [4]20,000	......	......	[1]32,000 [2]11,000 [3]10,600	[1]4,200 *1,400	[1]5,000 [3]1,800	3,100	2,400	......	......
Valero Refining Co.—Corpus Christi	NR	21,000	24,000	......	†53,000	2,650	......	......	[1]54,000	[7]8,000	[2]8,300 §2,500	......	......	10,000	[1]50.0	......
Total	**4,132,700**	**4,372,100**	**1,759,700**	**342,500**	**1,587,000**	**203,050**	**1,046,800**	**254,000**	**775,000**	**2,155,050**	**257,700**	**263,915**	**94,100**	**68,800**	**609.0**	**10,617**

Solvent extraction: [1]12,000 b/sd. [2]10,000 b/sd. [3]11,000 b/sd. [4]7,000 b/sd. [5]53,000 b/sd. [6]12,000 b/sd. †Heavy oil cracker. §Dimersol.

UTAH

Company and location	Crude capacity		Charge capacity, b/sd								Production capacity, b/sd				Hydrogen (MMcfd)	Coke (t/d)
	b/cd	b/sd	Vacuum distillation	Thermal operations	Cat cracking		Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt		
					Fresh feed	Recycle										
Amoco Oil Co.—Salt Lake City	40,000	41,500	......	......	[1]18,000	4,000	[4]6,000	......	......	[1]6,000	[1]4,000	[4]3,000	......	......	......	......
Big West Oil Co.—Salt Lake City	24,000	24,000	3,850	......	[2]4,900	1,500	[2]5,000	......	......	[1]6,000	[2]1,300	......	......	......	......	......
Chevron U.S.A.—Salt Lake City	45,000	NR	35,500	[5]8,500	[1]11,000 [2]7,000	None 1,000	[2]5,500	......	[4]5,500	[1]5,500	[2]4,300	[4]750	......	......	......	350
Crysen Refining Inc.—Woods Cross	NR	12,500	3,000	......	......	......	[2]3,000	......	......	......	......	......	......	......	......	......
Phillips 66 Co.—Woods Cross[1]	25,000	26,000	3,200	......	[2]8,400	2,600	[2]6,000	......	......	[2]11,000 [5]1,600	[2]2,100	......	......	1,700	......	......

Company and location	Crude capacity		Charge capacity, b/sd								Production capacity, b/sd					
	b/cd	b/sd	Vacuum distillation	Thermal operations	Cat cracking		Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
					Fresh feed	Recycle										
Seagull Refining Co.—Roosevelt	8,000	9,000	......	......	[1]6,000	200	[2]2,000	......	......	[1]2,000	*2,200	......	......	......	......	......
Total	**153,875**	**160,368**	**45,550**	**8,500**	**55,300**	**9,300**	**27,500**	......	**5,500**	**32,100**	**11,700**	**3,750**	......	**1,700**	......	**350**
Solvent extraction: [1]5,000 b/sd.																
VIRGINIA																
Amoco Oil Co.—Yorktown	51,000	53,000	29,000	[5]13,500	[1]27,500	2,000	[2]8,750	......	......	[1]9,000 [5]15,500	*2,400	......	......	......	......	825
Total	**51,000**	**53,000**	**29,000**	**13,500**	**27,500**	**2,000**	**8,750**	......	......	**24,500**	......	......	......	......	......	**825**
WASHINGTON																
Atlantic Richfield Co.—Ferndale	156,000	162,000	94,000	[5]48,000	......	......	[2]50,000	[1]50,000	[4]17,000	[1]32,000	......	......	......	......	[1]80.0	2,300
Chevron U.S.A. Inc.—Seattle	5,500	NR	6,000	......	......	......	......	......	......	......	......	......	......	5,000	......	......
Mobil Oil Corp.—Ferndale	77,000	79,000	28,000	......	[2]25,500	2,000	[4]11,800	......	......	[1]13,500 [5]15,000	[2]5,900	......	......	......	......	......
Shell Oil Co.—Anacortes	72,000	75,000	34,500	......	[1]36,000	12,000	[3]20,000	......	[3]8,000	[2]27,000 [5-7]21,000	[1]12,100	[4]2,900	......	......	......	......
Sound Refining Inc.—Tacoma	11,900	12,754	12,754	......	......	......	......	......	......	......	......	......	......	6,000	......	......
Texaco Refining & Marketing Inc.—Anacortes[1]	78,000	82,000	26,000	[5]13,000	[1]30,000	9,000	[2]20,000	......	......	[1]20,000 [4]17,000 [5]5,000	[1]6,600 *1,100	......	......	......	......	780
U.S. Oil & Refining Co.—Tacoma	NR	31,000	18,000	......	......	......	[2]6,000	......	......	[1]6,000 [4]4,000	......	......	......	8,000	......	......
Total	**429,850**	**447,543**	**219,254**	**61,000**	**91,500**	**23,000**	**107,800**	**50,000**	**25,000**	**160,500**	**24,600**	**2,900**	......	**19,000**	**80.0**	**3,080**
Solvent extraction: [1]7,400 b/sd.																
WEST VIRGINIA																
Quaker State Oil Refining Corp.—																
Newell	11,700	12,000	6,000	......	......	......	[2]3,200	......	......	[1]3,500	......	......	3,600	......	[1]1.2	......
St. Mary's	4,800	5,000	2,175	......	......	......	[2]1,200	......	......	[1]1,300	......	......	1,400	......	......	......
Total	**16,500**	**17,000**	**8,175**	......	......	......	**4,400**	......	......	**4,800**	......	......	**5,000**	......	**1.2**	......
WISCONSIN																
Murphy Oil USA Inc.—Superior	**32,000**	**34,000**	**20,500**	......	**[1]9,700**	**1,000**	**[2]8,000**	......	**[4]5,800**	**[1]9,000**	**[2]1,700**	......	......	**13,500**	......	......
WYOMING																
Amoco Oil Co.—Casper	40,000	41,000	7,000	......	[1]13,500	2,700	[4]6,000	......	......	[1]7,100	[1]1,700	......	1,500	......	......	......
Big West Oil Co.—Cheyenne	28,800	30,000	17,000	[4]9,000	[1]12,000	3,000	[1]1,000 [2]5,500	......	......	[1]7,500 [4]4,500	[2]2,750	[1]1,500	......	3,700	......	550
Little America Refining Co.—Casper	NR	20,000	9,000	......	[1]11,000	None	[2]5,500	......	......	[1-2]7,000 [4-5]4,000	*400	......	......	......	......	......
Mountaineer Refining Cl—LaBarge	NR	500	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Sinclair Oil Corp.—Sinclair	53,000	54,000	30,000	......	[1]21,000	1,000	[1]10,000	......	[3]10,000	[1]14,000 [4]12,000	[1]4,000 *750	......	......	5,000	......	......
Wyoming Refining Co.—Newcastle	12,500	13,500	......	......	[2]4,000	3,000	[1]2,750	......	......	......	[2]800	......	......	......	......	......
Total	**153,775**	**159,000**	**63,000**	**9,000**	**61,500**	**9,700**	**30,750**	......	**10,000**	**56,100**	**9,250**	**1,500**	**1,500**	**8,700**	......	**550**

INACTIVE REFINERIES

1. Ashland Petroleum Co., Freedom, Pa.—6,800 bc/d.
2. Chevron U.S.A. Inc., Baltimore, Maryland—14,200 b/cd.
5. Gary Refining Co., Fruita, Colo.—15,200 b/cd.
6. Gladieux Refinery Inc., Ft. Wayne, Ind.—20,000 b/cd.
7. Kenco Refining Inc., Wolf Point, Mont.—4,700 b/cd.
8. Pester Refining Co., El Dorado, Kans.—31,000 b/cd.
9. Sabre Refining Inc., Bakersfield, Calif.—9,500 b/cd.
10. Texaco Inc., Amarillo, Texas—20,000 b/cd.
11. Texaco Inc., Lawrenceville, Ill.—65,000 b/cd.

Worldwide Construction

Ailleen Cantrell
Director of Editorial Surveys

Major construction projects in worldwide processing and pipelining, showing capacities, contractors, estimated costs, and time of completion. Total capacity figure in "Remarks & completion" column includes capacity of project listed. Where no such figure is given, project listed is a new unit.

Refineries—WORLDWIDE CONSTRUCTION

*Designates projects listed for the first time in the Journal.

Company and location	Project	Capacity (b/d)	Remarks & completion
UNITED STATES			
Amoco Oil—			
*Texas City, Tex.	Isom	27,000	C_5-C_6. UOP. 1987.
	Alky	23,500	Eng: Fluor. Const: Brown & Root. Late 1986.
*Whiting, Ind.	Delay coke	5,000	30,000 b/d total cap. Fluor. 1987.
	Isom	23,000	C_5-C_6. UCC. 1987.
*Arco Petroleum Prod.—			
Carson, Calif.	Reformer	....	Revamp. Eng: Fluor. Con: Brown & Root. 1987
	Hydrotreat	70,000	Cat feed. Santa Fe Braun: 1986.
Ferndale, Wash.	Reformer	8,000	LPG recover. Eng: RM Parsons. Con: Bechtel. 1987.
	Coke calc	1,200 t/d	Under Const. Bechtel. 1986.
Ashland Petroleum—			
Canton, Ohio	Isom	6,500	Reform conver. Mar. 1987.
St. Paul Park, Minn.	Reform	8,000	Buffalo transfer. 1987.
*Chevron USA—			
Honolulu, Hawaii	Dimersol	2,500	Sept. 1987.
Coastal R&M Inc.—			
Corpus Christi, Tex.	Isom	10,000	C_5-C_6. Staff.
Conoco—Denver, Colo.	Reform	10,000	1987.
Exxon USA—Benicia, Cal.	Dimersol	2,200	IFP. Fall 1987.
Baytown, Tex.	Vac	80,000	288,000 total cap. Lummus Crest, HB Zachry. Late 1986.
	Flexicoker	25,000	Resid upgrade. Foster Wheeler, Brown & Root. Late 1986.
Giant Refining—			
Gallup, N.M.	Isom-C_5-C_6	5,000	TIP process. Mericon (FB&D). $12 MM. Feb. 1987.
*Hill Petroleum—			
Krotz Springs, La.	Cat poly	6,600	PetroFac.
Indiana Farm Bureau—			
Mt. Vernon, Ind.	Isom	1,500	C_5-C_6. UOP. Nov. 1986.
Kendall /Amalie (Witco)—Bradford, Pa.	Hydrotreat	253	3,300 total cap. Cat reform feed pretreat. Upgrade. 1987.
	Isom	1,000	1987.
	Lube	2,000	ROSE unit upgrade. Ford, Bacon, Davis. 1986.
Koch Refining—			
Corpus Christi, Tex.	Platform	33,500	Eng-procure: Litwin. Oct. 1987.
	Arom	16,000	23,600 total cap. BTX. Oct. 1987.
Rosemount, Minn.	Crude	70,000	230,000 total cap. Eng-procure: Ford, Bacon, Davis. May 1987.
	Vac	15,000	115,000 total cap. Eng-procure: Ford, Bacon, Davis. May 1987.
*Mobil Oil Corp.—			
Torrance, Calif.	Hydrotreat	....	Also hydrogen unit. Parsons. Con: Kellogg. Fall 1988.
*Phillips 66—			
Woods Cross, Utah	Isom	2,600	C_5-C_6. Lic: UCC. Eng: staff. Nov. 1987.
*Sahuaro Petroleum & Asphalt—Coolidge, Ariz.	Asphalt	4,150	
Shell Oil—			
Anacortes, Wash.	Crude-Vac	....	Expan. Eng: SIP. 1986.
Wilmington, Calif.	Crude-Vac	....	Expan. Eng: SIP. 1987.
Wood River, Ill.	Cat dewax	9,000	Badger. 1988.
*Texaco Refining-Marketing—			
El Dorado, Kans.	Isom	15,000	Fall 1987.
	Hydrotreat	20,000	Fall 1987.
*Total Petroleum—			
Alma, Mich.	Dewax	2,000	Mobil MDDW process. In house. Nov. 1986.
	Isom	5,000	UOP and Howe Baker. Dec. 1986.
	Hydrotreat	5,000	Naph. $3.5 MM. Eng. Stearns-Catalytic. Nov. 1986.
Arkansas City, Kans.	Crude-vac	30,000	Litwin. $16 MM. July 1987.
Unocal Corp.—Chicago, Ill.	Isom	7,400	Lic: UCC. Con: Fluor on both units. 1987.
	Hydrotreat	8,000	22,000 total cap. Naph. unionfiner.
San Francisco, Calif.	isom	7,400	Lic: UCC. Con: Fluor. 1987.
	Crude-vac	30,000	Bechtel. 1987.

REFINERIES

Company and location	Project	Capacity (b/d)	Remarks & completion
AJMAN			
Ajman-Saudi Refining.— Ajman	Refinery	200,000	Transport and reassembly of former Esso Milford Haven refinery. Dismantle, mark, ship: Ventech International. Operational 1987.
ARGENTINA			
Isaura SA— Bahia Blanca	Crude	12,000	24,000 total cap. Eng: Kellogg. Con: McKee. 1988 on all units.
	Vacuum	11,300	New. Kellogg. McKee.
	Visbreak	3,800	New. Kellogg. McKee.
	FCC	6,300	New. Kellogg. McKee.
YPF—La Plata	Vac	29,900	99,400 total cap. $320 MM. Eng: JGC and Sade over all. Sept. 1987 on all units.
	Delay coke	17,900	39,900 total cap.
	FCC	26,900	71,900 total cap.
Lujan de Cuyo	FCC	19,700	40,600 total cap. LCI, Techint, FW Iberia. Sept. 1987.
	Delay coke	19,300	49,300 total cap. LCI, Techint. Aug. 1987.
	Hydroref	11,800	LCI, Techint. Sept. 1987.
AUSTRALIA			
*Ampol Refineries— Lytton, Brisbane	Crude	7,000	72,000 total cap. June 1987.
	Hydrotreat	5,000	Distil. LCO. Lic: Union. Design: Union, Davy McKee. Staff will build. June 1987.
BP Australia— Kwinana	Resid crack	25,000	Eng. stage. $50 MM. Lic: Total Pet. Eng: Stone-Webster and Davy McKee Pacific. Jan. 1987.
BANGLADESH			
*Eastern Refinery— Chittagong	Visbreak	....	Revamp. Eng. Lummus Crest. 1988.
BRAZIL			
Petrobras— Duque de Caxias	Crude	4,200	225,500 total cap. Engenharia. 1987
	Hydrotreat	....	Naph. desulf. Planning.
	Hydrotreat	....	SR dist. Planning.
	Hydrotreat	....	Other dist. Planning.
São José dos Campos	Solvent extract	28,400	Eng: Ultratec. Process: Staff on all projects. 1987.
*Paulinia	FCC	40,000	Under const. Lic: Kellogg. Eng: Promon. 1989.
CANADA			
Chevron Canada Ltd.— Burnaby, B.C.	Alky	2,000	$9 MM. 1987.
Consumers Cooperative Refinery Ltd.—Regina, Sask.	Heavy oil	50,000	Tech-manage: Fluor-Kilborn. $650 MM. NewGrade. Early 1988.
Dome Petroleum Ltd.— Lindbergh, Alberta	Crude	15,000	40 mi nw of Lloydminster. Planned.
Bonnyville, (ne Edmonton)	Heavy oil	25,000	Proposed.
Husky Oil Ltd.— Lloydminster	Heavy oil	54,000	Hydrocracker and delayed coking. $1.4 billion. Eng. started. PCL-Braun-Simons. SNC/FW Ltd., Bantrel Group Eng. and Partec Lavalin. Lic: HRI, Texaco, & FW USA. Completion: mid 1990.
*NewGrade Energy Inc.— Regina, Sask.	Heavy oil	....	Atm. resid desulf unit. Eng: Fluor Canada. $15 MM. Late 1988.
Petro-Canada— Fort McMurray	Crude	70,000	$4 billion. Planned.
Shell Canada Resources— Peace River, Alberta	Crude	10,000	$200 MM. Late 1986.
Montreal East	FCC	....	$80 MM. Contract: SNC/FW Ltd.
Texaco Canada— Nanticoke, Ont.	Cat reform	2,000	26,000 total cap. Concat regen. UOP/Texaco. Nov. 1986. Also upgrading crude, vacuum, FCC, and alky units. Stone & Webster Canada. $80 MM. Completion: May 1987.
CHILE			
Empresa Nacional del Petroleo—Concon	Visbreak	10,000	$15 MM. Lic: Kellogg. Eng: Foster Wheeler. 1987.
CHINA			
*China Fu Lui Corp.— Yunan, Shaanxi Province	Refinery	10,000	Ship and rebuild. (Former Gulf Canada Calgary refinery).
Guangzhou Petrochemical Corp.—Huang Pu, Guangdong	Visbreak	20,000	Shell Soak. Lummus Crest BV. Early 1989.
	FCC	25,000	Resid. Eng stage. Lic: Stone & Webster. 1988.
Nanhai Oil Shenzhen Develop. Service Corp.— Nantou Peninsula, Shenzhen, Guangdong Province	New ref	40,000	$21 MM. Yugoslav contract. Finance: Mutual Oil of America Inc., Reno, Nev.
Sinopec—Changling	FCC	25,000	Resid. Eng. stage. Lic: Stone & Webster. 1988.
*Funshun, Liaoning	Alky	2,010	Stratco tech. Turnkey: Bechtel.
Huang Pu	Demex	16,000	Vac resid. Design: UOP.
Nanjing	FCC	25,000	Resid. Eng. stage. Lic: Stone & Webster. 1988.
*Shengli, Shandong	Alky	1,206	Stratco tech. Turnkey: Bechtel.
Wuhan	FCC	20,000	Revamp under way. Lic: Stone & Webster. 1988.
*Qi-Lu, Shandong	Hydrotreat	....	Eng. Lummus Crest. 1988.
Zhenahi	FCC	25,000	Revamp under way. Lic: Stone & Webster. 1987.
Yanshan Petrochemical Corp.—Yanshan, Beijing	Visbreak	20,000	Shell Soak. Lummus Crest BV. Early 1989.

REFINERIES

Company and location	Project	Capacity (b/d)	Remarks & completion
CHINA, TAIWAN			
Chinese Petroleum Corp.— Kaohsiung	Delay coke	15,000	19,300 total cap. Lummus Crest. End 1986.
	Resid HDS	30,000	Eng. stage .JGC. 1989.
Ta Lin Pu	Resid HDS	30,000	JGC. End 1986.
	Resid crack	25,000	Eng. Kellogg. 1990.
Tao-yuan	Resid HDS	30,000	Chiyoda. Mid 1987.
	Resid HDS	15,000	Planned. Mid 1990.
	Hydrogen MMcfd	35.0	Steam meth reform. JGC, Chiyoda. Mid 1987.
COLOMBIA			
Ecopetrol— Barrancabermeja	Crude	20,000	170,000 total cap. Jan. 1988.
	Vac	15,000	95,000 total cap. Jan. 1988.
CZECHOSLOVAKIA			
Bratislava	Hydrocrack	16,000	Eng. Snamprogetti. 1988.
Litvinov, Bohemia	Vac	30,000	Snamprogetti.
ECUADOR			
CEPE—Esmeraldas	Crude	30,015	90,615 total cap. $121 MM. Turnkey: Chiyoda. Oct. 1987 on all units.
	Vac	14,500	43,020 total cap.
	Visbreak	12,600	25,200 total cap.
	FCC	3,400	16,000 total cap.
	Asphalt	1,760	3,000 total cap.
Nepo Province (Shushufindi)—	New ref	10,000	Tecplant-Ingest, Spain. Feb. 1987.
EGYPT			
Alexandria Petroleum.— (El-Mex) Alexandria	Crude	42,500	159,500 total cap. Planning. 1988.
Assuit Oil Refining.— Assuit	New ref	86,000	2 stages. Bechtel GB. $350 MM. 1986-1st stage. 1989-2nd stage
Cairo Oil Refining.— Tanta	Crude	17,000	43,000 total cap. Planning. 1988.
Suez Oil Processing.— El-Suez	Crude	42,500	66,500 total cap.
FRANCE			
*Shell Francaise— Berre	FCC	....	Transfer unit from Pauillac. Eng: Foster Wheeler. Completion: 1988.
*Total—Dunkirk	FCC	....	Revamp. Eng: Foster Wheeler. 1987.
GERMANY, WEST			
Deutsche Texaco AG— Grasbrook	Lube	....	Revamp. $18.3 MM. Late 1986.
Ruhr Oel—Gelsenkirchen	Delay coke	600 td	Expan. Eng: Foster Wheeler. 1986.
*Wintershall AG— Salzbergen	Deasphalt	....	Propane. Revamp under study. Badger.
	Vac Dist	....	Badger.
GREECE			
Hellenic Aspropyrgos Refinery—Aspropyrgos	Vac	46,600	50,900 total cap. Lic-eng: Asprofos. Biokat over all construction. 1987 all units.
	Visbreak	21,600	Lic: LCI. Eng: Asprofos.
	FCC	23,300	Lic: Exxon. Eng: FWI.
	Cat reform	20,000	Lic: IFP. Eng: FWI.
	Hydrocrack	25,500	Feed treat. Lic: IFP. Eng: FWI.
	Hydroref	9,700	Gas oil desulf. 25,300 total cap. Planned.
	Hydrogen	9.1 MMcfd	Steam LPG reform. Lic-eng: FWI.
	Poly	1,500	C_3 dimersol. Lic: IFP. Eng-Const: Tecnicas Reunidas. 1987.
	Poly	1,000	C_4 dimersol. Lic: IFP. Eng-Const: Tecnicas Reuindas. 1987.
	Isom	7,000	C_5-C_6 feed. Lic: UCC. Eng: Asprofos. 1988.
	LPG sweet	9,600	Lic: UOP. Eng-con: Mannesmann. 1987.
	Gaso treat	15,800	Lic: UOP. Eng-con: Mannesmann. 1987.
Motor Oil Hellas—Corinth	Isomerizer	3,200	C_5-C_6. Lic: UCC. Technipetrol. Dec. 1986.
HUNGARY			
Dunai KV—Százhalombatta	Arom	9,800	BTX. Under const. Lic: PCK Schwedt. Olajterv-OKGT. 1986
	Visbreak	14,000	FW Spain. 1986.
INDIA			
Cochin Refineries— Cochin	Arom	1,700	Benzene. EIL. Aug. 1987.
*Hindustan Petroleum Corp.— Bombay	FCC	2,000	11,000 total cap. Apr. 1988.
	Lube oils	1,500	Bright stocks. Oct. 1988.
Indian Oil Corp.— Gauhati	Crude	4,800	21,200 total cap. EIL. Dec. 1986.
Gujarat	Crude	44,500	192,000 total cap. EIL. June 1988.
Mathura	Crude	30,000	150,000 total cap. EIL. Dec. 1987.
Hindustan Petroleum— Mangalore	New ref	120,493	$900 MM-1983. Feasibility study.
Indian Oil Corp.— Karnal, Haryana	New ref	120,493	$1.1 billion. Approved.
IRAN			
*NIOC.—Bandar Abbas (Strait of Hormuz)	New ref	220,000	Includes lube plant. Bids out.
Arak	New ref	200,000	Planned.
IRAQ			
Seorgi—Baiji	Vac dist	15,843	Technip and Czecho-Technoexport. Sept. 1987.
	Deasphalt	5,328	Propane.
	Furfural	9,284	Texaco process.
	Lube oil	4,300	

REFINERIES

Company and location	Project	Capacity (b/d)	Remarks & completion
ITALY			
API—Falconara	Crude	5,864	Replace. Technipetrol. Jan. 1987.
Esso Italiana—Augusta	FCC	5,200	44,500 total cap. 1988.
	Cat reform	10,600	18,200 total cap. Semi concat. 1989.
	Hydrotreat	4,200	18,200 total cap. Feed pretreat. 1989.
	Hydrotreat	9,400	35,200 total cap. SR dist. 1987.
	Hydrotreat	5,400	Dist. 1990.
	hf Alky	1,200	8,400 total cap. 1988.
	Lubes	650	13,250 total cap. 1987.
	Asphalt	170	9,670 total cap. 1987.
*Soc. Energia Montedison—Priolo	Alky	2,814	Stratco tech. Mid 1988.
Tamoil—Cremona	Vacuum	35,000	All units planned. Late 1987.
	Therm crack	14,000	Late 1987.
	Visbreak	21,000	Reduce from 33,000 b/d.
	Hydroref	4,500	18,000 total cap. Mid dist. Mid 1987.
JAPAN			
Idemitsu Kosan CL—Aichi	FCC	30,000	Eng. stage. JGC on all units. Mar. 1987.
*Kyushu Oil CL—Oita	Hydrocrack	8,000	Dist. upgrade. Dec. 1987.
KOREA			
Kukdong Oil CL—Seosan	Crude	60,000	HOC Phase 2. Badger. 1987.
KUWAIT			
Kuwait National Petroleum—Mina Al-Ahmadi	FCC	30,000	New. JGC. 1986.
	Hycrack	38,000	Lic: Chevron. JGC. 1986.
Mina Abdulla	Crude	156,200	$2.1 billion. KSFBraun contractor over all. End 1987 on all units.
	Vacuum	127,000	New.
	Hydroref	60,000	91,150 total cap. Resid desulf.
	Hydrotreat	35,000	Kerosine. Lic: IFP.
	Hydrotreat	25,000	Diesel. Lic: IFP.
	Hydrotreat	7,500	Naphtha desulf. Lic: IFP.
	Hydrotreat	3,200	Merox-naphtha. Lic: Union Oil.
	Hydrogen	144.0 MMcfd	183.5 MMcfd total cap. Steam methane reform.
	Hydrogen	24.0 MMcfd	H_2 recovery
	Hydrocrack	38,000	Dist. upgrade. Lic: Chevron.
	Delay coke	60,000	Two units. New. Lic: Santa Fe Braun.
	Coke	1,950 t/d	
LIBYA			
Ras Lanuf Oil & Gas Processing.—Ras Lanuf	Vac	79,252	Foster Wheeler. End 1986.
	Delay coking	11,848	Foster Wheeler. End 1986.
	Cat reform	22,386	End 1986.
	Hydrocrack	43,980	Dist upgrade. Planned.
	Hydrotreat	27,954	Naph desulf. 1986.
	Benzene	2,593	End 1987.
	Coke, t/d	606	
MALAYSIA			
Shell Refining Co. Bhd.—Port Dickson	Bitumen	2,400	Revamp and expansion includes asphalt resid burner, mild vac unit, crude unit overhall. Fluor Nederland. Eng-design complete: late 1987.
MEXICO			
Petroleos Mexicanos: Cadereyta, Nuevo Leon	Visbreak	50,000	Dec. 1987.
Lazaro Cardenas, Mich.	New ref	200,000	Planned.
	Vacuum	120,000	
	Cat reform	40,000	
	Hydrotreat	40,000	Cat feed pretreat.
	Hydrotreat	16,000	Naphtha desulf
	Hydrotreat	50,000	Distillates.
Minatitlan	Visbreak	50,000	Eng. stage. Staff. 1989.
Salina Cruz	Crude	165,000	Under const. Staff. 1989.
	Crude	165,000	Planned. Staff. 1990.
	Visbreak	50,000	Eng. stage. Staff. 1989.
	Vac	80,000	Under const. Staff. 1989.
	Vac	80,000	Planned. Staff. 1990.
	FCC	40,000	Eng. stage. Staff. 1989.
	Cat reform	30,000	Cyclic bimcat. Eng. stage. Staff. 1989.
	Hydrotreat	86,000	Total capacity 3 units. Eng. stage. Staff. 1989.
Tula	Crude	165,000	Under const. 1987.
	Vac	80,000	Under const. Staff. 1987.
	Cat reform	30,000	Semi bimcat. Eng. stage. 1987.
	Cat reform	30,000	Eng. stage. Staff.
	Hydrotreat	172,000	Total capacity 6 units. Eng stage. Staff.
NETHERLANDS			
*Kuwait Petr. Europoort—Rotterdam	Isom	6,200	Penex/molex. Turnkey: Santa Fe Braun. Mid 1988 on all units
	Naph HDT	30,000	
	Platform	20,000	Concat regen.
Shell Internationale Petr.—Pernis, Rotterdam	Modernize	....	$750 MM over all. Includes Hycon unit (hydrogen conversion), and desulfurizers. Contractor: Lummus Crest BV. Completion: 1990.
NIGERIA			
Nigerian National Petroleum Corp.—Cross Rivers State	New ref	100,000	Request for EPC bids pending.
Kaduna	Crude	10,000	Expan. to 50,000 b/d Crude Unit 1. 110,000 total cap. of Units 1&2. Chiyoda. 1986.

REFINERIES

Company and location	Project	Capacity (b/d)	Remarks & completion
Port Harcourt	Crude	150,000	JGC over all. 1987 on all units.
	Vac	54,000	
	FCC	40,000	
	Reformer	33,000	Contin. regen.
	Polymeriz	4,900	Dimersol.
	Hydrotreat	33,000	Naphtha
	Hydrotreat	14,500	Kerosine
	hf alky	7,000	
	Treater	11,400	Merox.
	Treater	24,000	Merox.
	Isomerizer	3,600	
NORWAY			
Rafinor A/S—Mongstad	Crude	55,000	[illegible]45,000 total cap. $650 MM. [illegible] & Foster Wheeler on all units. 1989.
	RCC	40,000	Eng: UOP.
	Cat reform	16,000	Contin conven.
	Hydrotreat	16,000	26,000 total cap. Cat reform feed pretreat. UOP lic.
	Hydrotreat	6,500	23,000 total cap. Distillates. Union lic.
	hf Alky	7,000	Phillips lic.
	Cat poly	4,500	
OMAN			
Oman Refinery.— Mina al Fahal	Crude	30,000	[illegible] total cap. $25 MM. Eng: [illegible] Sept. 1987.
PAKISTAN			
National Refinery— Korangi	Crude	10,000	57,750 total cap. Jan. 1987
	Cat reform	4,000	6,750 total cap. July 1987.
PERU			
Petroleos del Peru—			
Conchan	Crude	2,000	1,000 total cap. 1992.
Iquitos	Crude	1,500	12,000 total cap. 1994.
La Pampilla	Visbreak	31,000	New. Eng: UOP. 1990.
	Vac	42,000	New. Eng: UOP. 1990.
	FCC	15,000	New. Eng: UOP. 1995.
Pucallpa	Crude	1,400	4,000 total cap. Staff. 1994.
Talara	Crude	10,000	75,000 total cap. 1988.
	Vac	1,000	26,000 total cap. 1988.
	FCC	2,100	18,000 total cap. 1988.
SAUDI ARABIA			
Petromin Lubricating Oil Refinery (Petromin and Mobil)—Yanbu	Lube plant	4,109	$160 MM. Eng. stage.
*Saudi Arabian Lube Additives CL—Yanbu	Lube add.	....	$12 MM. Saudi Eng-Const. Late 1986.
SPAIN			
Union Explosivos Rio Tinto— La Rabida	Visbreak	10,000	IFP, Foster Wheeler. 1987.

Company and location	Project	Capacity (b/d)	Remarks & completion
SWEDEN			
AB Nynas Petroleum— Nynaeshamn	Hydrotreat	2,000	4,300 total cap. Lube po 1987 on all units.
	Lube oils	900	3,500 total cap.
	Hydrogen	1.8	2.7 MMscfd total cap.
THAILAND			
Bangchak Petroleum— Bangkok	Ref upgrade	....	$143 MM. Consult: Chiyo
Thai Oil Refinery—Sriracha	Crude	12,600	76,460 total cap. Foster
	Vac	29,800	Wheeler. 1989 on all unit
	Visbreak	7,400	17,000 total cap.
	Cat reform	2,300	7,600 total cap. Semi bim
	Hydrocrack	15,400	Dist upgrade.
	Hydrogen MMcfd	28.0	Steam meth reform.
TUNISIA			
Government—Gabes	New ref	150,000	
TURKEY			
Turkish Petroleum Refineries—Aliaga-Izmir	Crude	102,020	Eng: Naftechimpromexp Con: Alarko, Tekfen, Pro san, Gama, Elpim. 1987.
UNITED KINGDOM			
BP Oil Grangemouth Ref. Ltd.—Grangemouth	Upgrade	....	$69 MM. Foster Wheeler on cracker, cat reform. Wim and Honeywell on tech. hydrogen-LPG units. Cos Petrocarbon. 1989.
Llandarcy, Wales	SR asphalt	3,300	Late 1986.
Esso—Fawley	Isom	17,000	$60 MM. Lummus Cr 1986.
Shell UK—Stanlow	FCC	55,250	$259 MM. Foster Wheeler ergy. Late 1986.
URUGUAY			
*Ancap—Montevideo	Modern	30,000	Planned. Kellogg. 1987.
U.S.S.R.			
Tenguiz	New ref	100,000	Partec Lavalin Canada Lurgi Germany, Litwin Fra Completion: 1988.
Omsk	Gaso feed fraction	51,107	Technip over all.
	Hydrodesulf	21,925	Eng: Litwin.
Ufa	Gaso feed fraction	51,107	Technip over all.
	HDA	21,925	Eng: Litwin.
VENEZUELA			
Maraven SA—Cardon	Flexicoker	69,000	$933 MM. Exxon Tech. 19
ZAMBIA			
Indeni Petroleum Ref. CL— Ndola	Crude	6,350	31,350 total cap. UOP. 19
	Hydrocrack	5,300	Dist upgrade. UOP. 1987.

Petrochemicals—WORLDWIDE CONSTRUCTION

*Designates projects listed for the first time in the Journal.

UNITED STATES

***ADVANCED POLYPRO RESINS INC. Marysville, Mich.** 40,000 t/y polypropylene in engineering stage. Contractor: MES. Completion: 1988.

ALLIED CORP. Moncure, N.C. 9,000 mt/y polyester expansion under way. Feed: terephthalic acid, ethylene glycol.

Philadelphia, Pa. 9,000 mt/y phenol, 5,400 mt/y acetone expansion under way. Feed: cumene.

***BASF. Freeport, Tex.** 4,000 mt/y neopentyl glycol expansion under way. Staff. Completion: early 1987.

CAROLINA EASTMAN. Columbia, S.C. Polyester polymer expansion in engineering stage. Contractor: Bechtel. Completion: 1986.

CELANESE CHEMICAL. Clear Lake, Tex. 175 MM lb/y acrylic acid expansion. Feed: propylene. Planned. Completion: 1987.

160 MM lb/y acetic acid expansion. Feed: propylene. Planned. Completion: 1987.

CHEVRON CHEMICAL. Cedar Bayou, Tex. 25,000 mt/y alpha olefins expansion under construction. Feed: ethylene. Completion: late 1986.

***EXXON CHEMICAL AMERICAS. Baytown, Tex.** Polypropylene unit in engineering stage. Contractor: MES. Completion: 1988.

GENERAL ELECTRIC. Mt. Vernon, Ind. Bisphenol A expansion under construction. Contractor: John Brown Eng. Completion: 1986.

HERCULES INC. Jefferson, Pa. 50 MM lb/y resin plant. Completion: late 1986.

HIMONT. Bayport, Tex. 140,000 mt/y polypropylene unit in engineering stage. Contractor: Tecnimont. Completion: 1986.

Lake Charles, La. 140,000 mt/y polypropylene unit in engineering stage. Contractor: Tecnimont. Completion: 1986.

KOCH REFINING. Rosemount, Minn. 16,000 mt/y BTX. Staff process. Completion: late 1987.

PHILLIPS 66. Pasadena, Tex. 85,000 t/y polypropylene expansion (210,000 t/y total capacity). Eng: Fluor. Const: HB Zachry. Completion: Mid 1987.

SENTRY POLYMERS. Freeport, Tex. Polymers unit. $2 MM. Contractor: Frantz.

SUN REFINING & MARKETING. Marcus Hook, Pa. 155,000 mt/y MTBE unit under construction. Arco process. $14 MM. Design-eng: Stone & Webster. Completion: early 1987.

***USI CHEMICALS. Port Arthur, Tex.** 100,000 mt/y polyethylene unit. Lic: BPChem. Eng-contractor: Kellogg. Completion: late 1987.

ARGENTINA

DUPERIAL SAIC. San Lorenzo. 4,600 mt/y phthalic anhydride expansion planned. (17,000 mt/y total cap.) Feed: orthoxylene. Eng: Davy Powergas. Contractor: Duperial. Completion: 1989.

ELECTROCLOR SAIC. Bahia Blanca. 41,500 mt/y polyvinyl chloride plant under construction/ Feed: vinyl chloride. Contractor: McKee. Completion: mid 1989.

FERTILIZANTES NEUQUINOS SA. Neuquen. Ammonia, urea plant. Proposed. $100 MM. Feasibility study: Sener.

INDUPA. Bahía Blanca. 15,000 mt/y polyvinyl chloride (emulsion). Hoechst process. Contractor: Uhde. Completion: 1986.

45,000 mt/y polyvinyl chloride (suspension). Hoechst process. Contractor: Uhde. Completion: 1986.

MONSANTO ARGENTINA. Zarate. 25,000 m/ty polystyrene plant. Feed. styrene. $17.5 MM. Contractor: Sade. Completion: July 1986.

PETROPOL. Bahia Blanca. 32,000 mt/y hd polyethylene unit. Hoechst process. Contractor: Uhde. Completion: 1986.

PETROQUIMICA AUSTRAL. La Mision, Tierra del Fuego. 680,000 mt/y methanol plant planned. $310 MM. Project manager: Tecnicas Reunidas. Completion: early 1987.

PETROQUIMICA BAHÍA BLANCA. Bahía Blanca. 45,000 mt/y ethylene expansion under way. Feed: ethane. Completion: 1987.

PETROQUÍMICA CUYO SAIC. Lujan de Cuyo, Mendoza. 60,000 mt/y polypropylene plant. BASF process. Eng: Lurgi. $90 MM-84. Completion: Spring 1987.

PETROQUÍMICA GENERAL MOSCONI. Ensenada. 25,000 mt/y butene-1, 33,000 mt/y oxoalcohols. Feed: LPG. Engineering: Technip. $260 MM. Completion: 1987.

43,000 mt/y MTBE unit in engineering stage. Contractor: Snamprogetti.

45,000 mt/y dimethyl terephthalate. Feed: paraxylene. Planned. Completion: 1988.

PETROQUIMICA NORDPATAGÜNICA. (Dow Chemical 100%). **Centenario, Neuquen.** 90,000 mt/y ld-hd polyethylene plant. $225 MM. Argentine approved.

AUSTRALIA

AFL HOLDINGS LTD. Newcastle, NSW. 40,000 mt/y ammonia expansion under construction. Completion: Sept. 1986.

ALTONA PETROCHEMICAL CL. (Mobil and Esso). **Altona.** 200,000 mt/y ethylene expansion. Feed: mixed natural gas liquids. $300 MM. Planned. Completion: late 1986.

SHELL CHEMICAL AUSTRALIA PL. Geelong. 75,000 mt/y (total capacity) polypropylene expansion under construction.

75,000 mt/y (total capacity) hydrocarbon solvents and aromatics expansion under construction.

AUSTRIA

PETROCHEMIE DANUBIA. Schwechat. 80,000 mt/y hd polyethylene unit under construction. Sheripol tech. $15 MM. Contractors: Tecnimont and John Brown Eng. Completion: 1986.

BANGLADESH

CHITTAGONG UREA FERTILIZER LTD. Chittagong. 1,000 mt/d urea unit, 1,000 mt/d ammonia unit under construction. Lic-ammonia: Kellogg. Contractor: TEC. Completion: 1987.

BRAZIL

CAPUAVA CARBONOS INDUSTRIAIS. Triunfo, RS. 18,000 mt/y carbon black unit. Feed: ethylene tar. Planned. Completion: 1989.

CARBONOS COLOIDAIS. Candeias, Bahia. 20,000 mt/y carbon black expansion planned. $20 MM.

COPENE. Camaçari. 25,000 mt/y butene-1 unit under construction. $15 MNM. Feed: raffinate 2. Completion: 1986.

COPERBO. Cabo. 32,000 mt/y ethylene unit planned. Feed: ethyl-alcohol.

12,500 mt/y polyisoprene expansion planned. Feed: isoprene. Completion: Nov. 1986.

NITRIFLEX. Camaçari, Bahia. 5,500 resins. $20 MM. Completion: 1988.

Duque de Caxias, RS. 4,000 NBR, Resins. $7 MM. Completion: 1987.

Triunfo, RS. 10,000 mt/y epm-epdm units planned. Feed: ethylene, propylene. $40 MM. Contractor: SB Engenharia. Completion: 1987.

NITROCARBONO SA. Camaçari. 8,000 mt/y caprolactam unit under construction. Feed: benzene. Completion: Oct. 1987.

PETROQUÍMICA UNIÃO. Santo André. 12,000 mt/y PIB. Feed: naphtha. Planned. $15 MM. Contractor: Chevron.

POLIALDEN PETROQUÍMICA. Camacari. 12,000 mt/y hd polyethylene expansion (92,000 total cap). Feed: ethylene. Completion: late 1987.

POLIPROPILENO SA. Triunfo, RS. 100,000 mt/y polypropylene plant planned. Feed: propylene. Completion: 1990.

POLISUL PETROQUÍMICA. (Ipiranga, Hoechst, Petrobras, and Int'l Finance). **Triunfo.** 60,000 mt/y hd polyethylene plant. $110 MM.

***PRONOR. Camacari.** 8,000 mt/y polyols-polyurethane unit planned. Feed: amines-isocyanates. $4 MM. Contractor: Synthesia Espanola.

21,000 mt/y nitrobenzene unit planned. Feed: benzene. $12 MM.

15,000 mt/y aniline unit planned. Feed: nitrobenzene. Planned. $16 MM.

BULGARIA

Burgas. 80,000 mt/y MTBE unit. Chemische Werke Hüls technology. Eng-const: Neftochim.

*150,000 mt/y ethylene plant under construction. Lic: Kellogg. Eng: Kellogg-Kawasaki. Contractor: Neftochim. Completion: 1988.

Sofia. 15,000 mt/y phthalic anhydride under construction. Contractor: Lurgi.

CANADA

ALBERTA ENERGY LTD. and COMINCO CHEMICALS & FERTILIZERS. Joffre, Alberta. 350,000 mt/y ammonia plant under construction. $105 MM. Completion: Spring 1987.

ALBERTA GAS CHEMICALS LTD. Medicine Hat, Alta. 1,100 mt/d ammonia unit. Planned. Feed: Hydrogen from methanol. $103 MM-Can. Completion: 1987.

ALBERTA NATURAL GAS. Scotford. 2,000 t/d methanol, 11,600 b/d MTBE. Feed: natural gas, butane. Before ERCB. $600 MM.

HIMONT. Varennes. 120,000 mt/y polypropylene unit under construction. Contractor: Tecnimont. Completion: 1986.

CHILE

CAPE HORN METHANOL LTD. Punta Arenas. 748,000 mt/y methanol unit under construction. Lic: BASF. Eng-contractor: Kellogg. Completion: 1988.

CHINA

Beijing. 60,000 mt/y styrene plant. Monsanto/LCI tech. $30 MM. Contractor: Lummus Crest. Completion: mid 1988.

***Harbin.** 22,000 mt/y phthalic anhydride plant in engineering stage. Contractor: Davy McKee. Completion: 1987.

Heilongjiang. 15,000 t/y carbon black plant. $10 MM. Proposed.

Jilin. 5,000 mt/y polystyrene unit. Contractor: TEC. Completion: 1986.

Nanking. 200,000 t/y polyvinyl chloride unit. Design: Shin Etsu.

300,000 t/y acetylene unit, 450,000 t/y aromatic hydrocarbon unit. Completion: 1986.

200,000 mt/y ethylene glycol-ethylene oxide unit under construction. Halcon SD process. Eng-design-con: Halcon and TEC. Completion: 1986.

***Luzhou.** 750 t/d urea expansion under construction. Design-eng: Tecnimont. Completion: 1988.

150 t/d ammonia expansion under way. $10 MM. Contractor: Humphreys & Glasgow.

Shengli. 80,000 mt/y SBR unit under construction. Contractor: Mitsubishi Heavy.

Shanxi. 300 mt/y ammonia under construction. Feed: coal. Topsoe process. Contractor: Lurgi.

Taching. 60,000 mt/y acetaldehyde unit. Aldehyd GmbH process. Contractor: Uhde. Completion: 1986.

200,000 mt/y ethanol unit. Huels process. Contractor: Uhde. Completion: 1986.

65,000 mt/y ld polyethylene unit. Imhausen process. Contractor: Uhde. Completion: 1986.

Tengrian, Shandong Province. 200 mt/d ammonia in engineering stage. Design: Texaco. Eng: Bechtel, Cntic. Completion: 1987.

***Tianjin.** 20,000 mt/y propylene oxide unit in engineering stage. Contractor: TEC. Completion: 1989.

15,000 mt/y carbon black plant under construction. Feed: EB and coal tar dist. Tech-design: Continental Carbon. Construction: TEC. Completion: early 1987.

BEIJING YANSHAN PETROCHEMICAL CORP. Qianjin. Ethylene plant modernization. $15 MM. Eng-training: Lummus Crest. Completion: mid 1987.

CHINA NORTH INDUSTRIES CORP. Lanzhou. 44 MM lb/y toluene diisocyanate plant. Contractor: BASF AS.

***FUSHUN PETROCHEMICAL CORP. Fushun, Liaoning Province.** 10,000 mt/y polystyrene plant. Cosden tech.

QILU PETROCHEMICAL. Zibo, Shandong Province. 15,000 t/y butene-1, 40,000 t/y MTBE units. Butene-Nippon Zeon process. Lic: IFP on MTBE. Contractor: JGC. Completion: Aug. 1987.

***Qilu, Shandong Province.** 63,500 t/y polypropylene plant. Himont tech. $40-50 MM. Eng studies: Sino Fluor. Construction completion: late 1989.

SHANGHAI INVESTMENT AND TRUST. Shanghai. 5,000 mt/y acrylonitrile, styrene copolymer unit. Contractor: TEC. Completion: 1987.

SINOPEC INTERNATIONAL. Daqing. 60,000 mt/y ethylene expansion under construction. Contractor: Mitsubish Heavy Ind. Completion: 1988.

***Liao Yang.** 50,000 mt/y ethylene expansion in engineering stage. Lic-eng: KTI. Contractor: Technip. Compltion: 1987.

Nanjing. 22,000 mt/y linear alkylbenzene expansion (72,000 mt/y total cap.). Eng-design: UOP.

Yueyang, Hunan Province. 4,000 mt/y resins plant in engineering stage. Contractor: JGC. Completion: 1987.

YANSHAN UNITED FOREIGN TRADE CL. Yanshan and Shandong provinces. 120,000 mt/y styrene plant. Monsanto/LCI tech. Contractor: Lummus Crest. Completion: mid 1988.

CHINA, TAIWAN

CHINESE PETROLEUM CORP. Kaohsiung. 400,000 mt/y ethylene, 228,000 mt/y propylene, 67,500 mt/y butadiene, 240,000 mt/y aromatics. Feed: naphtha, gas oil. Planned. Completion: 1992.

CHINA PETROCHEMICAL DEVELOPMENT CORP. Lin Yuan. 30,000 mt/y naphthalene unit. Feed: fuel oil. Completion: 1987.

CHIUNGLONG PETROCHEMICAL CL. Kaohsiung. 22,000 mt/y polypropylene glycol unit under construction.

***FORMOSA CHEMICALS & FIBRES CORP. Suao.** 200,000 mt/y terephthalic acid unit under constructon. Contractor: Zimmer. Completion: 1987.

***HUALON CORP. Tou Fen.** 23,000 mt/y polyamide 6 polymerization unit under construction. Contractor: Zimmer. Completion: late 1986.

HO TUNG CHEMICAL CORP. Jen-Wu, Kaohsiung. n-paraffins plant under construction. Feed: kerosine, light diesel.

***TAIWAN SYNTHETIC PETROCHEMICAL CORP. Kaohsiung.** 40,000 mt/y SBA unit in engineering stage. Eng: CTCI.

USI FAR EAST CORP. Kaohsiung. 120,000 mt/y lld polyethylene. Feed: ethylene. Planned.

COLOMBIA

POLICOLSA. Barrancabermeja. 9,000 mt/y propylene expansion planned (24,000 mt/y total cap).

CZECHOSLOVAKIA

Litvinov. 16,000 b/d unicracker for upgrading ethylene feedstocks and ethylene unit modifications. Engineering stage. Contractor: Lummus Crest. Completion: 1987.

EGYPT

EGYPTIAN PETROCHEMICALS. Ameriya, Alexandria. 100,000 mt/y vinyl chloride, 60,000 mt/y chlorine, 66,000 mt/y caustic soda units under construction. TEC. Completion: 1986.

200,000 m/ty ethylene unit under study.

100,000 mt/y ld polyethylene and 40,000 hd polyethylene units under study.

FINLAND

NESTE OY. Porvoo. 70,000 mt/y cumene expansion. Eng. stage. Feed: benzene, propylene. $10 MM. Contractor: Lummus Crest. Completion: 1988.

10,000 mt/y phenol, 6,000 mt/y acetone expansion. Planned. Completion: 1987.

FRANCE

ARCO FRANCE. Fos-sur-Mer. 150,000 mt/y propylene oxide unit. Eng: Foster Wheeler. Completion: 1988.

*380,000 mt/y gasoline grade TBA in engineering stage. Eng: Foster Wheeler. Completion: 1988.

50,000 mt/y propylene glycol unit. Completion: Sept. 1988.

SNEA. Feyzin. 50,000 t/y MTBE. Contractor: Technip. $5.9 MM. Completion: early 1987.

GERMANY (EAST)

Berlin. 350,000 mt/y ethylene expansion in engineering stage. Contractor: Linde.

Schkopau. 25,000 mt/y hd polyethylene plant in engineering stage. Unipol process. Feed: ethylene. Contractor: Linde AG.

Schwedt. 60,000 mt/y acrylonitrile plant under construction. Contractor: Technimont. Completion: 1987.

GERMANY, WEST

DYNAMIT NOBEL AG. Witten. 1,500 mt/y polyamide, 7,000 mt/y polyester, 15,000 mt/y plasticizers expansions. Planned. Completion: 1987.

EC ERDÖLCHEMIE. Cologne. 500 mt/y isoamylene and 500 mt/y amylethylether units under construction. Completion: 1986.

PHENOLCHEMIE. (site undetermined). 200,000 mt/y phenol, 124,000 mt/y acetone. Feed: cumnene. Planned.

***RHEINISCHE OLEFINWERKE. Wesseling.** 20,000 mt/y polypropylene bloc-cops expansion under construction. Feed: propylene. Completion: late 1986.

GREECE

HELLENIC Aspropyrgos. 63,000 mt/y MTBE unit. $15 MM. Lic: Snamprogetti. Turnkey: Tecnicas Reunidas-Spain. Completion: Feb. 1987.

MOTOR OIL HELLAS. Corinth. 34,000 mt/y MTBE unit. Contractors: Snamprogetti, Technipetrol. Completion: Dec. 1986.

HUNGARY

Szazhalombatta. 35,000 mt/y orthoxylene expansion under construction. Feed: xylene mix. Aris process (PCK Schwedt). Completion: 1986.

INDIA

***ASIAN PAINTS INDIA LTD. Bombay.** 13,500 t/y phthalic anhydride plant in engineering stage. Contractor: Davy McKee. Completion: 1989.

ARAVALI FERTILIZERS LTD. Sawai Madhopur, Rajasthan. 1,350 mt/d ammonia plant, two 1,100 mt/d urea plants. $370 MM. Snamprogetti tech. Completion: end 1988.

ASSAM INDUSTRIAL DEVELOPMENT CORP. Maron-Lakwa. Planned facility for 7,500 t/y methanol, 12,000 t/y formaldehyde, 6,000 t/y PVC. Engineering on methanol: Humphreys & Glasgow.

DCM. Kota. Ammonia expansion under construction. $5 MM. Process design: Chiyoda. Completion: 1986.

FERTILIZERS & CHEMICALS TRAVANCORE LTD. (FACT) Cochin. 50,000 mt/y caprolactam expansion. Eng. stage. $250 MM. Turnkey: Fedo. Completion: Nov. 1987.

GARWARE NYLONS LTD. Poona. 250 mt/y pure glycol. Feed: crude glycol.

4,830 mt/y nylon 6 expansion in engineering stage. Design: Humphreys & Glasgow.

HALDIA PETROCHEMICAL LTD. Haldia, West Bengal. Petrochemical complex in engineering stage. Management: Linde.

HERDILLIA CHEMICALS LTD. Thane. 450 mt/y cumyl phenols recovery. Feed: phenol waste stream. Planned. Contractor: Powergas India Ltd.

10,000 mt/y EDPM rubber. Feed: ethylene, propylene. Planned.

2,000 mt/y diphenyl oxide, 1,500 mt/y isopropyl phenols, 1,000 mt/y plasticizers units. Planned. Feed: phenol, propylene, phosphorous, oxychloride.

3,500 mt/y alkyl phenols unit under way. Feed: phenols, olefins. Contractor: Power Gas India. Completion: 1986.

HINDUSTAN ORGANIC CHEMICAL. Cochin. 40,000 mt/y phenol unit under construction. Lic: UOP. Contractor: KTI. Completion: 1986.

HINDUSTAN POLYMERS. Visakhapatnam. 2,000 mt/y polystyrene plant under construction. Feed: styrene. Completion: Dec. 1987.

3,000 mt/y ABS planned. Completion: Dec. 1988.

INDIAN FARMERS FERTILIZER COOP. LTD. Aonla-Uttar Pradesh. 2,200 mt/d urea unit under construction. Feed: natural gas. $700 MM. Contractors: Snamprogetti and SIPA Italy. Completion: April 1988.

INDIAN PETROCHEMICALS CORP. LTD.

Baroda. 25,000 mt/y polypropylene unit under construction. Lic-eng: Tecnimont. Contractor: EIL. Completion: 1987.

10,000 mt/y dimethyl terephthalate expansion-Phase 2. Feed: paraxylene. $15 MM. Contractor: EIL. Completion: July 1987.

10,000 mt/y dimethyl terephthalate expansion-Phase 3. Feed: naphtha. Lic-eng: Dynamit Nobel. Contractor: EIL. Completion: 1988.

24,400 mt/y orthoxylene expansion. Feed: naphtha. Contractor: EIL. Completion: 1988.

49,000 mt/y paraxylene, mixed xylenes expansion. Feed: naphtha. Lic-eng: UOP-Mobil. Contractor: EIL. Completion: 1988.

Nagothane. 60,000 mt/y polypropylene plant under construction. Contractor: Tecnimont. Completion: 1987.

300,000 mt/y ethylene, 30,000 mt/y propylene units, 36,000 mt/y FCC propylene reocovery unit. Lic: Stone & Webster.

80,000 mt/y ld polyethylene unit. Lic: Cdf Chimie.

135,000 mt/y lld-hd polyethylene units.

50,000 mt/y ethylene glycol, 5,000 mt/y ethylene oxide, 3,600 diethylene glycol, 160 mt/y triethylene glycol units. Lic: union Carbide.

1,740 mt/y acetylene black unit.

INDO GULF FERTILIZERS & CHEMICALS CORP. LTD. Jagdishpur, Sultanpur UP. 2,200 mt/d urea (twin streams). Feed: natural gas. RS. 8,000 MM (US $667 MM aprox.). Contractors: Snamprogetti-Italy, PDIL-India. Completion: April 1988.

INDO-NISSAN CHEMICAL. Baroda. Oxoalcohols unit under construction. Contractor: Humphreys & Glasgow.

McDOWELL & CI. Visakhapatnam. 2,000 mt/y polystyrene unit under construction. Feed: styrene. Completion: late 1986.

MYSORE PETROCHEMICALS LTD. Raichur. 3,000 mt/y phthalic anhydride expansion (12,000 total capacity) under review.

NAGARJUNA FERTILIZERS & CHEMICALS LTD. Kakinada. 1,500 mt/y urea unit under construction. Feed: naphtha. $500 MM. Contractor: Snamprogetti. Completion: April 1989.

NATIONAL FERTILIZERS LTD. Bijaipur, Madhya Pradesh. 445,000 mt/y ammonia, 726,000 mt/y urea units under construction. Feed: natural gas. Snamprogetti on urea and Haldor Topsoe on ammonia. Completion: 1987-88.

NATIONAL PETROCHEMICAL CORP. Koyali, Gujarat. 100,000 mt/y ethylene, 60,000 mt/y propylene, 9,000 mt/y butadiene, and 12,000 mt/y mixed butadienes.

OIDB (Oil Industry Development Board—India). **Salempur, Uttar Pradesh.** 540,000 aromatics and phthalic anhydride plant. $654.2 MM. Preparatory: EIL.

***RELIANCE INDUSTRIES LTD. Haldia.** 100,000 t/y linear alkylbenzene unit in engineering stage. Contractor: Lummus Crest. Completion: 1988.

Hazira. All units in engineering stage: 120,000 t/y lld polyethylene, 80,000 t/y ethylene oxide, 200,000 t/y ethylene oxide, 200,000 t/y vinyl chloride, 110,000 t/y ethylene glycol. Contractor: Lummus Crest. Completion: 1989.

TAMILNADU PETROPRODUCTS LTD. (Tamilnadu Industrial Dev. Corp. Ltd. and Southern Petrochemical Industries Corp Ltd.). 50,000 mt/y linear alkyl benzene. UOP processes.

TRAVANCORE FERTILIZER & CHEMICAL. Udyogamandal. 50,000 b/d caprolactam unit in engineering stage. $25 MM. Eng: Chiyoda. Completion: 1986.

INDONESIA

PERTAMINA. South Sumatra. 225,000 mt/y phthalic anhydride, 175,000 mt/y cyclohexane, 369,000 mt/y aromatics units under construction. $1,000 MM. Consult: Davy Powergas. Completion: 1986.

PERTAMINA, BRITISH PETROLEUM, CHEVRON (Gulf Corp.). Sengkang gas field, south Sulawesi. 1,500 mt/d ammonia plant. $276 MM. Planned. Completion: 1989.

PT PETROWIDADA (40% Daewoo Corp.-Korea, 60% PT Petrokimia Gresik and PT Witulan). **Greski, East Java.** 30,000 t/y phthalic anhydride, 1,500 t/y maleic anhydride plant. $18 MM. Eng-manage: Daewoo. Contractor: Lurgi.

IRAN

NATIONAL PETROCHEM. Shiraz. 1,200 mt/d ammonia unit under construction. Contractor: Humphreys & Glasgow.

***Arak.** 240,000 mt/y ethylene plant in engineering stage. Contractors: KTI with Technipetrol. Completion: 1987-88.

IRAQ

Baiji. 50,000 mt/y linear alklbenzene complex. Contractor: Technipetrol. Completion: Dec. 1986.

*1,000 t/d ammonia plant under construction. Lic-eng: Kellogg. Contractor: Hitachi Zosen.

*1,750 t/d urea plant under construction. Lic: Stamicarbon. Eng: Kellogg. Contractor: Hitachi Zosen.

ISRAEL

GADOT PETROCHEMICALS INDUSTRIES. Haifa. 30,000 mt/y solvents expansion. Feed: raffinate. 20,000 mt/y paraxylene expansion. Feed: solvent xylene. Completion: 1987.

10,000 mt/y maleic anhydride unit. Feed: benzene. Completion: 1987.

FERTILIZERS & CHEMICALS LTD. Haifa. 15,000 mt/y ammonia expansion planned. Feed: naphtha. Completion: 1986.

8,000 mt/y urea unit under construction. Completion: 1986.

60,000 mt/y nitric acid unit planned.

ITALY

ALUSUISSE ITALIA. San Giovanni Valdarno (Arezzo). 25,000 mt/y phthalic anhydride unit under construction. Completion: Jan. 1987.

JAPAN

IDEMITSU PETROCHEMICAL. Tokuyama. 100,000 mt/y paraxylene unit. UOP parex.

NIPPON ZEON. Tokuyama. 20,000 mt/y butadiene rubber unit under construction. Contractor: Mitsubishi Heavy. Completion: 1986.

NIPPON MINING CL. Chita. 100,000 mt/y paraxylene unit under construction. Feed: reformate gasoline. Completion: Jan. 1987.

OSAKA BUTADIENE. Takaishi, Osaka. 75,000 mt/y butadiene unit planned. Feed: B-B fraction.

TEKKOSHA CL. Yokkaichi. 16,500 t/y resins unit planned.

TONEN SEKIYU KAGAKU. Wakayama. 100,000 mt/y paraxylene expansion. Feed: reformate. Completion: mid 1987.

KOREA

DEMOCRATIC PEOPLE'S KOREAN REPUBLIC. 10,000 t/y ethylene oxide-glycol plant. $6.5 MM. Contractors: Japan Catalytic Chemical and Hitachi Shipbuilding & Engineering.

DAINONG PETROCHEMICAL INDUSTRY CL. Ulsan. 1,000 mt/y phthalic anhydride unit under construction. Feed: maleic anhydride.

HANNAM CHEMICAL. Ulsan. 20,000 mt/y SAN unit planned. Feed: acrylonitrile-styrene. Lic: Cosden.

HONAM OIL REFINRY (Lucky Ltd. and Caltex Overseas). **Yeocheon.** 77,000 mt/y polypropylene plant. Lic: Union Carbide and Shell. Completion: mid 1987.

250,000 mt/y ethylene plant. $150 MM. Eng: Lummus Crest. Contractor: TEC. Completion: 1988.

LUCKY LTD. Yeocheon. 30,000 mt/y polystyrene unit planned. Feed: styrene.

SAM KYUNG CHEMICAL CL. Ulsan. 10,200 mt/y (total capacity) phthalic anhydride unit in engineering stage. Contractor: Davy McKee. Completion: 1987.

***SAM YANG CL. Joenju.** 30 t/d PES expansion. Contractor: Didier. Completion: late 1986.

***TONG YANG NYLON CL. Seoul.** 14,000 mt/y polyamide 6 polymerization unit under construction. Contractor: Zimmer. Completion: late 1986.

YUKONG LTD. Ulsan. 250,000 mt/y ethylene, 108,000 mt/y propylene, 39,000 mt/y butadiene units planned. Feed: naphtha. Completion: Sept. 1988.

80,000 mt/y polyethylene unit planned. Feed: ethylene. Completion: Sept. 1988.

*150,000 mt/y ethylene revamp in engineering stage. Lic-eng: Kellogg. Completion: 1988.

KUWAIT

PETROCHEMICAL INDUSTRIES. Shuaiba. 60,000 mt/y polypropylene. Planned. Eng-design-const: Santa Fe Braun. Late 1988.

LIBYA

RAS LANUF REFINERY AND GAS PROCESSING. Ras Lanuf. 330,000 mt/y ethylene plant under construction. Manage-coordinator: Technimont. Competion: 1989.

MEXICO

CELANESE MEXICANA. La Cangrejera, Ver. 30,000 mt/y phthalic anhydride unit planned.

QUERETARO, Qro. 25,000 mt/y polyester polymer expansion under way.

FENOQUIMIA. Cosoleacaque, Ver. 38,000 mt/y phenol expansion planned. Feed: cumene. 2,400 MM pesos. Completion: late 1987.

FERTILIZANTES MEXICANOS. Ciudad Camargo, Chih. 495,000 mt/y urea unit under construction. Contractor: Snamprogetti.

Lazaro Cardenas, Mich. 495,000 mt/y urea unit under construction. Contractor: Snamprogetti.

PEMEX.

Camargo, Chihuahua. 1,500 mt/d ammonia unit under construction. Lic-eng: Kellogg. Completion: June 1989.

Ciudad Madero, Tamps. 50,000 mt/y acrylonitrile unit in engineering stage. Contractor: Uhde-IMP. Completion: June 1987.

Cosoleacaque, Ver. 825,000 mt/y methanol unit in engineering stage. Contractor: Uhde-IMP. Completion: Dec. 1990.

La Cangrejera. 80,000 mt/y polyethylene unit under construction. Contractor: ICI. Completion: June 1989.

120,000 mt/y cyclohexane unit in engineering stage. Completion: 1988.

Lazaro Cardenas, Mich. 445,000 mt/y ammonia unit under construction. Lic-eng: Kellogg. Completion: 1989.

Morelos. 350,000 mt/y propylene unit in engineering stage. Feed: propane. Lic: Houdry. Contractor: Bufete. Completion: June 1988.

50,000 mt/y acrylonitrile unit under construction. Contractor: Niigata. Completion: Dec. 1987.

100,000 mt/y polyethylene unit under construction. Contractor: Asahi. Completion: Dec. 1988.

6,000 mt/y acrolein unit in engineering stage. Completion: 1987.

30,000 mt/y acrylic acid unit in engineering stage. Completion: 1987.

100,000 mt/y butadiene unit in engineering stage. Completion: 1989.

500,000 mt/y ethylene unit under construction. Completion: 1987.

75,000 mt/y isopropanol unit in engineering stage. Completion: 1988.

200,000 mt/y ethylene oxide unit under construction. Completion: 1986.

100,000 mt/y polypropylene unit under construction. Completion: 1988.

150,000 mt/y acetaldehyde unit in engineering stage.

Salamanca. 60,000 mt/y normal paraffins and 50,000 mt/y olefins units planned. Completion: Oct-Dec. 1988.

Salina Cruz, Oax. 1,500 mt/d ammonia unit in engineering stage. Contractor: Kellogg. Completion: Dec. 1988.

San Martin, Pue. 50,000 mt/y acrylonitrile unit under construction. Contractors: Niigata and Vistron. Completion: June 1987.

Tula. 60,000 m/ty normal paraffin and 50,000 mt/y olefin units planned. Completion: Oct-Dec. 1988.

PRODUCTOS DE ESTIRENO SA DE CV. Atizapan, Edo. 8,000 mt/y ABS, 5,000 mt/y SAN expansions planned. 2,800 MM pesos. Completion: late 1987.

PROMOCIONES INDUSTRIALES MEXICANAS (PRIMEX). Altamira, Tams. 30,000 mt/y dioctylphthalate unit. Feed: phthalic anhydride. Chemische Werke Hüls process. Contractor: Lurgi. Completion: 1986.

40,000 mt/y 2-ethyl hexanol unit planned. Feed: acetaldehyde. Chemische Werke Hüls process. Contractor: Lurgi. Completion: 1986.

NETHERLANDS

DSM. Geleen. 60,000 mt/y ld polyethylene unit under construction. Contractor: Stamicarbon. Completion: 1987.

GENERAL ELECTRIC. Bergen-Op-Zoom. Polyphenylene oxide unit in engineering stage. $105 MM. Contractor: John Brown. Completion: 1986.

***NEDERLANDSE STIKSTOF MAAT. Sluiskil.** 1,750 mt/d ammonia expansion under construction. $110 MM. Contractor: Santa Fe Braun. Completion: 1987.

SHELL NEDERLAND CHEMIE. Pernis. 90,000 mt/y polypropylene unit under construction. Feed: propylene. Completion: mid 1987.

100,000 t/y MTBE unit. Planned.

NETHERLANDS ANTILLES

LAGO OIL & TRANSPORT CL. Aruba. 400,000 mt/y MTBE plant. Design: Sener SA, Spain and Fish Eng.

NIGERIA

***NIGERIAN NATIONAL PETROLEUM CORP.**

Kaduna. 35,000 mt/y linear alkylbenzene unit under construction. Feed: kerosine, benzene. $149 MM. Contractor: Lummus Crest. Completion: Mar. 1987.

15,000 mt/y benzene unit under construction. Feed: cat reformate. Completion: Chiyoda. $10.8 MM. Completion: Mar. 1987.

Port Harcourt, Rivers state.
Petrochemical complex comprising:

400,000 mt/y ethylene, 100,000 mt/y propylene, 270,000 mt/y polyethylene, 35,000 mt/y ethylene glycol, 70,000 mt/y polypropylene, 15,000 mt/y butene 1, 100,000 chlorine-caustic soda, 145,000 m/ty vinyl chloride monomer, 140,000 mt/y polyvinyl chloride, 30,000 mt/y plasticizers, 26,000 m/ty 2 ethylhexane, 15,000 mt/y phthalic anhydride. $2 billion. Consult-manage-supervisor: Foster Wheeler. Completion: 1990.

NAFCON (National Fertilizer Co. of Nigeria). **Onne.** 1,000 t/d ammonia unit under construction. Contractor: Kellogg. Completion: 1987.

1,500 t/d urea unit under construction. Lic: Stamicarbon. Eng-contractor: Kellogg. Completion: 1987.

PETROCHEMICAL

PAKISTAN

PAKARAB. Multan. 300 t/d urea expansion under construction. Contractor: Snamprogetti. Completion: 1986.

POLAND

Kedzierzyn. 33,500 t/y butanol, 100,000 t/y 2-ethyl hexanol units under construction. 'DM 250MM.Contractor: Zimmer. Completion: 1986.

PORTUGAL

PETROQUÍMICA E GÁS DE PORTUGAL EP. Lisbon. 13,300 mt/y carbon dioxide expansion under construction. Completion: 1986.

RAS Al-KHAIMAH

WHEELABRATOR TECHNOLOGIES INC. 2,500 mt/d methanol plant. Feed: gas.

SAUDI ARABIA

ARABIAN PETROCHEMICAL. (100% Saudi Basic). **Al Jubail.** 100,000 t/y polystyrene unit, 50,000 mt/y butene-1 unit, Lic: Cosden Tech. and Chimique Charbonnages-France. Contractor: Chiyoda. Completion: 1988.

NATIONAL CHEMICAL FERTILIZER. 1,500 t/d ammonia unit under construction. Lic-eng: Kellogg. Contractor: TEC. Completion: 1988.

SAUDI EUROPEAN PETROCHEMICAL. (Sabic, Apicorp, Enichem-Italy, Neste Oy-Finland.) **Al-Jubail.** 500,000 mt/y MTBE, 124,000 mt/y butadiene, 80,000 t/y butane-1. Feed: methane. $600 MM. Contractor: Snamprogetti. Completion: 1988.

SAUDI ARABIAN FERTILIZER. Al-Jubail. 500,000 mt/y ammonia unit under study and planning. Feed: natural gas. (joint venture with Sabic). Completion: early 1988.

SINGAPORE

***PETROCHEMICAL CORP. OF SINGAPORE PL** and **C. Itoh & CL. Merbau Island.** 50,000 mt/y MTBE plant under construction. Sumitomo process. Feed: isobutylene. Completion: mid 1987.

SOUTH AFRICA

AECI LTD. Midland, Sasolburg. 75,000 mt/y lld polyethylene unit planned. (Phase 2 expansion). Feed: ethylene. Unipol process. Contractor: CJB. Completion: 1988.

SPAIN

ALCUDIA. Tarragona. 20,000 mt/y polypropylene expansion under way. Completion: 1986.

40,000 mt/y lld polyethylene (conversion from ldpe). $4.5 MM. Completion: 1986.

***BASF ESPANOLA SA. Tarragona.** 25,000 mt/y polypropylene plant. $17 MM. Contractor: Internacional de Ingenieria y Estudios Tech. Completion: mid 1987.

ENFERSA. Sagunto (near Valencia). 225,000 mt/d nitric acid plant. Contractors: SC Grande Paroisse and Espindesa-Spain. $42 MM. Completion: mid 1987.

***Cartagena, Murcia.** 30,000 mt/y urea (and ammonia) revamp. Planned. 1988.

***Puertollano.** 35,000 mt/y urea (and ammonia) revamp. Planned. 1988.

***ERTISA. Huelva.** Cumene and phenol unit revamps. Eng. stage. Contractor: Lummus Crest. Completion: 1988.

NALON SA. Trubia, Asturias. 100,000 mt/y coke plant. $4 MM. Completion: April 1987.

THAILAND

HMC POLYMERS CL. (Metro CL-Bangkok and Himont Inc.). **Mab Ta Pud, (Rayong province).** 100,000 mt/y polypropylene. Completion: late 1988.

NATIONAL FERTILIZER CORP. 900 t/d ammonia, 1,000 t/d urea. Eng-consult: Foster Wheeler Int'l. Completion: 1988.

NATIONAL PETROCHEMICAL CORP. Mab Ta Pud. 150,000 mt/y ethylene. Eng: Lummus Crest. $80 MM. Completion: late 1988.

THAI PETROCHEMICAL INDUSTRY CORP. Rayong. 60,000 mt/y hd polyethylene. Hoechst process. Contractor: Uhde. Completion: 1986.

1,750 t/d urea and 1,000 t/d ammonia units in engineering stage. $180 MM. Turnkey: Chiyoda. Completion: 1987.

THAI PLASTIC AND CHEMICAL CL. 140,000 mt/y vinylchloride monomer, 26,000 mt/y caustic soda, 60,000 mt/y polyvinylchloride. Completion: late 1988.

THAI POLYETHYLENE CL. 137,000 mt/y polyethylene. Completion: late 1988.

TRINIDAD

FERTILIZERS OF T&T LTD. Point Lisas. Two 230 mt/d ammonia expansions planned. $14 MM each. Completion: 1988.

TRINIDAD NITROGEN CL. (51% Government, 49% W.R. Grace). **Point Lisas.** 1,360 mt/d ammonia expansion. $140 MM. Eng-design: Santa Fe Braun. Completion: 1987.

TURKEY

PLASTIFAY. Istanbul. 15,000 mt/y phthalic anhydride unit under construction. Contractor: Davy McKee. Completion: 1986.

SASA. Adana. 42,000 mt/y polymer expansion under way. Contractor: Chemtex. Completion: early 1986.

***TUGSAS** (Turkiye Gubre Sanayii AS). **Gemlik.** 1,000 t/d ammonia unit under construction. Lic-eng: Kellogg. Completion: 1988.

UNITED KINGDOM

BP CHEMICALS LTD. Hull. 170,000 mt/y acetic acid-acetic anhydride. $100 MM. Manage: Davy McKee. Completion: 1988.

Grangemouth, Scotland. 25,000 mt/y methyl pentene. Contractor: Foster Wheeler. Completion: 1987.

***KEMIRA OY. Hull.** 550 t/d ammonia plant in engineering stage. Lic-eng-con: Kellogg. Completion: 1988.

LINDSEY OIL REFINING. Grimsby, South Humberside. 50 mt/y tertiary amyl methyl ether. Feed: isoamylene with C_5. Process: Erdoelchemie. Contractor: John Brown.

*100 mt/y MTBE. Process: Phillips. Contractor: John Brown.

***L&K FERTILIZERS LTD.** (subsidiary of Kemira Oy). **Hull.** 250,000 mt/y ammonia plant. Feed: hydrogen-nitrogen byproducts from acetic acid (from BP plant). Eng: MW Kellogg.

U.S.S.R.

Kalusch, Ukraine. 250,000 mt/y ethylene plant, 100,000 mt/y benzene, 117,000 mt/y pyro gaso units under construction. $121 MM. Lic: Houdry. Contractor: Linde. Completion: 1986.

Mozyl. 125,000 mt/y benzene unit under construction. Feed: toluene. Lic: Houdry. Contractor: Asahi. Completion: 1986.

Nishnekamsk. 200,000 mt/y linear alpha-olefins unit in engineering stage. Contractor: Davy McKee. Completion: 1989.

100,000 mt/y alkyl phenol. Huels process. Contractor: Uhde. Completion: 1986.

Polotsk. 60,000 t/y ethylene-propylene and 55,000 t/y acrylonitrile.

URUGUAY

***AKDENIZ GUBRE SANAYII AS. Mersin.** 1,100 t/d nitric acid unit in engineering stage. Lic: Stamicarbon. Eng: Kellogg. Completion: 1987.

VENEZUELA

INTEQUIM CA. Valencia. 12,600 mt/y formaldehyde unit. Feed: methanol. Contractor: Acensor Perstorp-Sweden. Completion: late 1986.

***PEQUIVEN. El Tablazo, Zulia.** 150,000 mt/y ethylene unit planned. Feed: ethane. Completion: 1990.

60,000 mt/y polyvinyl chloride unit planned. Feed: vinyl chloride. Completion 1990.

100,000 mt/y styrene unit planned. Feed: ethylene, benzene. Completion: 1992.

60,000 mt/y vinyl chloride unit planned. Feed: ethylene, chloride. Completion: 1990.

Jose, Anzoategui. 495,000 mt/y ammonia unit planned. Feed: natural gas. Completion: 1991.

1,500 mt/d ammonia unit in engineering stage. Contractor: Santa Fe Braun. Completion: 1989.

330,000 mt/y methanol unit planned. Feed: natural gas. Completion: 1989.

Moron, Carabobo. 396,000 mt/y ammonia unit planned. Feed: natural gas. Completion: 1990.

***PROPILVEN SA. El Tablazo, Zulia.** 45-70,000 mt/y polypropylene unit planned. Feed: propylene. Completion: 1989.

YUGOSLAVIA

Pancevo. 1,100 mt/d urea unit. Stamicarbon CO_2 stripping process. Contractor: Petroinvest and HIP.

Rijeka. Snamprogetti awarded contract for undisclosed capacity aromatic plant. 524,000 t/y high-octane gasoline.

Sulfur—WORLDWIDE CONSTRUCTION

*Designates projects listed for the first time in the Journal.

UNITED STATES

***CHEVRON USA. Gaviota, Calif.** 19 lt/d selectox tail gas unit (SO_2 scrubbing) under construction. $46 MM. Contractor: Stearns Catalytic. Completion: June 1987.

EXXON USA. Lincoln County, Wyo. 812 lt/d Claus unit (amine tail gas treating) under construction. $105 MM. Contractor: Stearns Catalytic. Completion: 1986.

***MOBIL OIL. Torrance, Calif.** Recovery unit from refinery. Completion: Fall 1988.

***VALERO REFINING. Corpus Christi, Tex.** 280 lt/d Sulften unit in engineering stage. Contractor: Ford, Bacon, Davis. Completion: 1987.

BRAZIL

PETROBRAS. 50 mt/d unit (from retorted shale gas). Contractor: Staff crews and Promon. Completion: 1987.

CANADA

***SYNCRUDE CANADA LTD.** 700 t/d expansion under construction. $17 MM. Eng-procure: Partec Lavalin. Completion: 1987.

2,200 t/d sulfreen plant expansion under construction. $16 MM. Eng-procure: Partec Lavalin. Completion: 1987.

CZECHOSLOVAKIA

***PKAZ.** 34 MMcfd unit under construction. Sulfint process. Contractor: Integral.

CHINA, TAIWAN

CHINESE PETROLEUM CORP. Kaohsiung. 246 t/d unit (from refinery gas). Eng-design: CTCI. Contractor: JGC. Completion: mid 1990.

25 t/d Sulften unit in engineering stage. Lic: Ford, Bacon, Davis and Union Carbide. Completion: 1987.

Ta Lin Pu. 200 mt/d unit (from refinery). Eng-design: CTCI. Completion: end 1986.

Tao Yuan. 200 mt/d unit (from refinery). Completion: mid 1987.

EGYPT

EL NASR PETROLEUM CO. El-Suez. 120.0 mt/d unit (from refinery gas). Planned. Completion: 1989.

GERMANY, WEST

BKB. Buschhaus. Two 175 t/d units in engineering stage. Contractor: Davy McKee. Completion: 1987.

KRUPP STAHL AG. Bochum. 2,200 t/y unit in engineering stage. Contractor: Krupp Koppers. Completion: 1986.

MOBIL OIL AG. Woerth. Two-stage Claus sulfreen unit. Contractor: Lurgi.

RUHR OEL. Gelsenkirchen. 48 t/d Claus sulfreen unit (from refinery gas). Contractor: Lurgi. Completion: 1986.

UNION RHEINISCHE BARUNKOHLEN KRAFTSTOFF. Wesseling. 125 mt/d unit (from refinery). Contractor: Lurgi. Completion: 1986.

***WINTERSHALL AG. Rutenbrock.** 2,700 t/y Claus unit in engineering stage. Contractor: Davy McKee. Completion: 1987.

GREECE

HELLENIC ASPROPYRGOS REFINERY. Aspropyrgos. 200 t/d unit (from refinery). Lic: Amoco. Eng-con: Snamprogetti-Madrid. Completion: 1986.

INDIA

OIL & NATURAL GAS COMM. Hazira. 65 t/d unit in engineering stage. KTI Locat process. Staff will build. Completion: 1987.

ITALY

ICT. Termoli. 3.7 t/d unit. $0.5 MM. Design: IGI.

KOREA

HONAM OIL REFINERY. Yeosu. 13.8 t/d recovery unit in engineering stage. Contractor: TEC.

KUKDONG OIL CL. Seosan. 160 t/d unit (from refinery).

KUWAIT

KUWAIT NATIONAL PETROLEUM. Mina Al-Ahmadi.

All Kuwait crude:

534 t/d hydrogen sulfide removal unit. Lic: Shell. Contractor: JGC. Completion: 1986.

460 t/d tail gas treating unit. Lic: Shell. Contractor: JGC. Completion: 1986.

Two 400 t/d tail gas treating units. Contractors: JGC-Uhde. Completion: 1986.

Mina Abdulla.

All Kuwait crude:

Three 270 t/d sulfur units. Lic: Amoco. Contractor: KSB (Kuwait Santa Fe Braun). Completion: 1987.

Two 510 t/d tail gas treating units. Lic: Shell. Contractor: KSB (Kuwait Santa Fe Braun). Completion: 1987.

140 t/d expansion under construction. Contractor: KSB. Completion: 1987.

MEXICO

PEMEX. Matapionche, Ver. 72.3 t/d (from natural gas). Planned.

Nuevo Pemex, Tab. 325.5 t/d (from natural gas) under construction.

NETHERLANDS

ESSO NEDERLAND. Rotterdam. Three 190 mt/d units in engineering stage. Contractor: Technipetrol. Completion: mid 1986.

NEDERLANDSE AARDOLIE MAATSCHAPPIJ. Emmen. 80 t/d unit under construction. Contractors: Badger and Chiyoda. Completion: 1987.

NORWAY

RAFINOR. Mongstad. 75.0 mt/d unit (from refinery gas). Completion: 1988.

***STATOIL. Stavanger.** 75 lt/d unit in engineering stage. Contractor: Ford, Bacon, Davis. Completion: 1988.

SINGAPORE

SINGAPORE REFINING. Singapore. 47 mt/d unit (from refinery gas). Contractor: JGC. Completion: 1986.

SPAIN

***CEPSA. Tenerife.** 14.5 lt/d unit in engineering stage. Eng-design: Ford, Bacon, Davis. Completion: 1986.

EMPETROL. Puertollano. 85 t/d unit (from refinery). Engineering stage. Contractor: Tecnicas Reunidas.

THAILAND

THAI OIL REFINERY. Sriracha. 33,000 t/y unit (from refinery) in engineering stage. McKee process. Contractor: Technip. Completion: 1987.

*Two 57.5 units under construction. Lic: Comprimo. Eng: Foster Wheeler. Completion: 1989.

TURKEY

TURKISH PETROLEUM REFINERIES CORP.

Izmir. 53 t/d expansion (from refinery gas). Completion: late 1986.

Kirikkale. 23 t/d unit under construction. Contractor: Parsons. Completion: late 1986.

USSR

Astrakhan. Phase 2: 2,970,000 mt/y (4 lines, integrated Claus-Sulfreen units, included in natural gas treatment plant). Engineering stage. $1 billion-lump sum. Snea process. Contractor: Technip. Completion: 1988.

Tenguiz. 1,580 t/d Claus sulfreen plant (from gas) in engineering stage. Contractor: Partec Lavalin. Completion: 1988.

VENEZUELA

LAGOVEN. Orinoco. 700 mt/d Claus recovery unit (heavy oil upgrader). Contractor: Parsons Int'l. Completion: 1988-89.

YUGOSLAVIA

***RAFINERIJA NAFTE. Pancevo.** 530 t/d sulfolane unit in engineering stage. Lic: UOP. Eng-contractor: Foster Wheeler. Completion: 1989.

Gas Processing—WORLDWIDE CONSTRUCTION

*Designates projects listed for the first time in the Journal.

UNITED STATES

AMOCO PRODUCTION. Anschutz Ranch East, Uinta County, Wyo. 300 MMscfd NGL recovery and nitrogen removal plant. Eng: Bechtel. Construction: Becon. Completion: Aug. 1987.

*50 MMscfd cryogenic NGL recovery plant. Contractor: Pro-Quip. Completion: Nov. 1986.

Anton Irish, Hale County, Tex. 100 MMscfd carbon dioxide recovery plant. Design stage. Completion: 1987.

Bairoil, Carbon County, Wyo. 65 MMscfd carbon dioxide recovery plant. Eng: Dresser. Completion: Sept. 1987.

Mallet 2, Hockley County, Tex. 65 MMscfd CO_2 recovery plant. Bidding stage. Completion: 1988.

Painter Complex, Uinta County, Wyo. 240 MMscfd NGL recovery and nitrogen removal plant. Contractor: Fish. Completion: Aug. 1987.

Wasson, Yoakum County, Tex. 80 MMcfd carbon dioxide reovery plant. Eng-const: Kellogg. Completion: 1987.

ARCO ALASKA INC. Prudhoe Bay. 3 billion cf/d plant under construction (at Tacoma, Wash. for shipment to Alaska). Ethane, propane, CO_2, 40,000 b/d NGL. Completion: mid 1987.

Kuparuk Field. Alaska. 80,000 b/d separation unit under construction. $165 MM. Contractor: Stearns Catalytic. Completion: Dec. 1986.

ARCO EXPLORATION & TECHNOLOGY. Willard plant, Texas. 73 MMscfd CO_2. Completion: June 1987.

CHAMPLIN PETROLEUM. Patrick Draw, Sweetwater County, Wyo. 46,680 g/d ethane, 21,740 g/d propane, 4,160 g/d isobutane, 6,560 g/d normal butane, 5,930 g/d gasoline. Cryogenic expander method. Replaces the refrig-abs process with 25 MMcfd turboexpander. Contractor: RL Frailey.

CHEVRON USA INC. Gaviota, Calif. 60 MMscfd plant under construction. 69,510 g/d propane, 83,244 g/d butane, 70,770 g/d NGL. Refrigeration only. $47 MM. Contractor: Stearns Catalytic. Construction: HB Zachry. Completion: June 1987.

COLORADO GATHERING & PROCESSING CORP. Weld County, Colo. 15 MMcfd plant expansion.

CONOCO. (50% Tenneco, 50% Conoco). **Farmington, N.M.** 500 MMcfd plant under construction. 1,700,000 raw NGL mix. Cryogenic-expander method. Contractor: Pan-West. Completion: Dec. 1986.

EXXON CORP. Crane Co., Tex. CO_2 recovery unit in engineering stage. Eng-design: Pritchard. Completion: 1986.

Lincoln County, Wyo. 480 MMscfd glycol (mole. seive) dehydration unit under construction. Contractor: Stearns Catalytic. $519 MM. Completion: 1986.

Sweetwater County, Wyo. 200 MMscfd CO_2 compression under construction. $26 MM. Stearns Catalytic. Completion: 1986.

MINERALS INC. Lea County, N.M. 75 MMcfd. 105,000 g/d ethane-propane mix. Cryogenic-expander method. Planning.

MOBIL CORP. Mobile Bay, Alabama. 80 MMcfd plant. Engineering stage. Contractor: Foster Wheeler. Completion: 1986.

NORTHWEST ALASKAN PIPELINE. Prudhoe Bay, Alaska. 2,000 MMscfd plant in engineering stage. Design-eng: Parsons. Completion: 1989.

***PETROGAS. Endeavor, Pa.** 3 MMscfd unit under construction. Refrig-Lean Oil- Absorp method. Design-eng: Frantz Co.

***SHELL WESTERN E&P INC. McComb, Miss.** 150 MMscfd CO_2 injection under construction. Design-eng: Ford, Bacon, Davis. Completion: 1986.

SOHIO ALASKA PETROLEUM. North Slope, Alaska. 55 MMscfd plant under construction. Contractor: Bechtel. Completion: 1986.

***Prudhoe Bay, Alaska.** Natural gas liquids expansion under construction. $14 MM. Contractor: Stearns Catalytic. Completion: June 1987.

STAUFFER CHEMICAL. Queen City, Tex. 4.5 MMcfd plant. Planned.

ALGERIA

Tinfouye Taban Kort. 4.2 MM t/d associated gas recovery unit in engineering stage. Contractor: JGC. Completion: 1987.

Rhourde Nouss. 1,455 MMscfd in engineering stage. NGL recovery. Turboexpander method. Contractor: Snamprogetti.

AUSTRALIA

HYDROCARBON EXTRACTION. Kurnell. 96,000 t/d LPG, 65,000 t/d C_2, 8,000 t/d C_5 NGL recovry in engineering stage. Contractor: Linde.

WOODSIDE OFFSHORE PETROLEUM PtL. Withnell Bay, Burrup Peninsula (near Karratha). 6 MM mt/y gas liquefaction plant. $3 billion. 2 MM t/y LNG trains. Contractors: Kellogg-JGC-Raymond. Completion: 1989-1990.

AUSTRIA

OeMV AG. Höflein, Aderklaa 2. 15.3 MMcfd plant under construction. 45,000 g/d LPG mix, 42,000 g/d condensate. Cryogenic expander method. Contractor: Pritchard. Completion: June 1987.

BURMA

PETROCHEMICAL INDUSTRIES CORP. Mann Field. 30,000 t/y LPG extraction plant under construction. Contractors: Mitsubishi Heavy Ind., Mitsubishi Corp., and Kinsho-Mataichi Corp. Completion: 1986.

CANADA

ATCOR RESOURCES LTD. Carbon, Alberta and Joffre, Alberta. 2.6 MMcfd (combined capacity) plants.

CHEVRON CANADA RESOURCES LTD. Brazeau. 4,500 b/d ethane plus recovery plant from 25 MMcfd gas. Completion: early 1987.

OCELOT INDUSTRIES. Peco, Alta. 25 MMscfd plant. Tech-lic: DPH. Awaiting ERCB approval. Contractor: Ortloff.

CHINA

CNTIC. Liache. 1.2 MM t/d ethane unit in engineering stage. Contractor: JGC. Completion: 1986.

Zhomg Yuan. 45 MMscfd plant in engineering stage. NGL recovery and fractionation in engineering stage. Turboexpander method. Contractor: Snamprogetti.

CHINA, TAIWAN

CHINESE PETROLEUM CORP. Taipei. 60 MMcfd plant under construction. 6,000 g/d condensate. Eng-consult: Santa Fe Braun. Completion: 1986.

EGYPT

EGYPTIAN GENERAL PETROLEUM CORP. Abu Rudies. 25 MMcfd plant (Phase 1). LPG, condensate, sales gas. Refrigeration method. Completion: mid 1987.

Dahshour. 100 MMcfd plant. 21,000 g/d condensate. Expander method. $24 MM. Completion: Jan. 1988.

Shukeir. 90 MMcfd (Phase 2). 130,236 g/d LPG, 84,325 g/d condensate. Cryogenic-Joule Thomson cryogenic-expander method. $31 MM. Contractor: Hitachi-Zosen. Completion: Dec. 1986.

FRANCE

ELF AQUITAINE. Lacq. 450,000 cm/h LPG. Contractor: Technip. Completion: 1987.

GERMANY

MOBIL OIL RAFFINERIE. Worth. 183,000 t/d LPG expansion in engineering stage. Cryogenic method. Contractor: Linde.

INDIA

OIL & NATURAL GAS COMMISSION. Uran, Bombay. Ethane-propane units. $140.2 MM.

Contractor: EIL. Completion: July 1987.

***South Bassein field, offshore Bombay.** 353 MMcfd gas processing-sweetening complex. Total cost: $250 MM. Snamprogetti contract-$138 MM. Completion: May 1988.

INDONESIA

TOTAL INDONESIE. Senipah. 3 MMcfd plant under study. 12,600 g/d condensate. Absorption method. Completion: 1986.

MALAYSIA

PETRONAS. Kertih, Terengganu. 250 MMcfd plant. 448,000 ethane, 214,000 propane, 125,000 butane, 338,000 condensate. Cryogenic expander method. Bids out for managenment and consulting. Completion: 1989.

MEXICO

PETROLEOS MEXICANOS. Cadereyta, NL. 4,500 b/d NGL fractionation unit under construction.

Morelos, Ver. 110,000 b/d NGL fractionation. under construction. Completion: 1986.

Nuevo Pemex, Tab. 500 MMcfd plant under construction.

24,000 b/d LPG sweetener under construction.

24,000 b/d LPG sweetener in engineering stage.

NETHERLANDS

NEDERLANDSE AARDOLIE MAATSCHAPPIJ BV. Emmen. 8 MMscm. Gas desulfurization. Contractor: Badger. Completion: 1987.

***PLACID INTERNATIONAL. North Sea.** 200 MMcfd natural gas treating plant under construction. CO_2 removal BASF MDEA process. Contractors: KTI with Protech. Completion: 1986-87.

SAUDI ARABIA

***ARABIAN AMERICAN OIL. Safaniya.** 600,000 b/d crude treater unit. Contractor: Niigata. Completion: Dec. 1986.

GOSP-4 complex: 100 Mscfd, 250,000 b/d in preliminary design. Lummus Crest.

SPAIN

ENIEPSA. Bilbao. 5 MMcfd gas treatment plant in engineering stage. $33 MM. Contractor: Tecnicas Reunidas. Completion: 1986.

THAILAND

PETROLEUM AUTHORITY OF THAILAND. (25% PTT, 75% Thai Shell Exploration-Production). **Sirikit field, Kamphaeng Phet.** 25 MMcfd plant. 35,000 t/y LPG.

UNITED KINGDOM

ARCO OIL PRODUCING CO. Bacton. 300 MMscfd plant under construction. Contractor: Parsons. Completion: 1986.

MOBIL OIL. Coryton. LPG recovery expansion. Contractor: Parsons. Completion: 1986.

SHELL UK (FULMAR). St. Fergus, Scotland. 120 MMsfd plant under construction: Contractor: Parsons. Completion: 1986.

St. Fergus, Scotland. 550 MMscfd (total capacity) plant expansion in engineering stage. Eng: Parsons. Completion: 1986.

SHELL SE INDE. Bacton. Plant expansion under construction. Contractor: Parsons. Completion: 1986.

USSR

Astrakhan. Phase 2: 6.9 billion Nm3/y natural gas and treatment (also see sulfur). $I billion-lump sum. Engineering stage. Contractor: Technip. Completion: 1988.

Tenguiz. 120 MMscfd plant in engineering stage. Turboexpander method. $200 MM. Contractor: Partec Lavalin. Completion: 1988.

Related Fuels—WORLDWIDE CONSTRUCTION

*Designates projects listed for the first time in the Journal.

UNITED STATES

AGRIFUELS REFINERY. New Iberia, La. 35 MM g/y ethanol under construction. Contractor: Lummus Crest. $103 MM. Completion: 1987.

GAS RESEARCH INSTITUTE. Hanna, Wyo. 200 t/d underground coal gasification under construction. $8.5 MM. Contractor: Stearns Catalytic. Completion: Nov. 1987.

SHELL OIL. Deer Park, Tex. 400 t/d coal gasification. $150 MM. Design: Lummus Crest. Completion: March 1987.

AUSTRALIA

BROWN COAL LIQUEFACTION (VICTORIA) PtL. (Kobe Steel, Mitsubishi Chem., Nisshoiwai, and Australian Government). **Morwell, Victoria.** 50 t/d SCR coal liquefaction plant under construction. Contractor: Davy McKee Pacific. Completion: 1987.

BRAZIL

PETROBRAS. Cão do Xisto, São Mateus do Sul, Paraná. 2,500 b/d shale oil plant. Eng: Paulo Abib, Promon, Staff. Contractors: Confab, CBC, Jaraguá. Completion: 1987.

CANADA

DOME PETROLEUM LTD. Lindbergh, Alta. (40 mi nw of LLoydminster). 15,000 b/d from oil sands. $300 MM. Planned.

Bonnyville, ne of Edmonton, Alta. 25,000 b/d heavy oil. Proposed.

ESSO RESOURCES LTD. Cold Lake, Alta. Phase 3 and 4. 37,700 b/d bitumen. $200 MM. Completion: 1986. $400 MM expansion to be completed mid-1988.

HUSKY OIL LTD. Lloydminster, Sask. 54,000 b/d heavy oil upgrading plant. Completion: March 1989.

PETROCANADA. Fort McMurray. 70,000 b/d from oil sands. $4 billion. Planned.

SHELL CANADA RESOURCES. Peace River, Alberta. 10,000 b/d heavy oil from bitumen. Completion: late 1986. (40,000 b/d by early 1990's).

SYNCRUDE CANADA LTD. Fort McMurray. 30,000 b/d expansion under construction. Contractor: Kellogg. Completion: 1988.

CHINA

***DALIAN GAS CO. Dalian.** 20 t/d gas by coal carbonization plant under construction. Contractor: Babcock Woodall Duckham Ltd. Completion: 1986.

FIRST HEAVY MACHINERY WORKS. Fularji, Heilongjian Province. 140 MMbtu/h fuel gas from coal gasification plant in engineering stage. Contractor: KRW Energy System (Kellogg Rust Synfuels). $25 MM.

GERMANY

***VE AHB INDUS.ANLAG. Schwedt.** 740,000 resid upgrade (HSC-Desus process). Eng. stage. Contractor: TEC. Completion: 1988.

INDIA

HEAVY ENGINEERING CORP. INDIA. Dankuni. 200,000 t/y coal gasification plant underconstruction. £1.6 MM. Construction super: Babcock Woodall-Duckham. Completion: 1987.

POLAND

KOPEX. Libiaz. 101.7 MMcfd Silesian bituminous coal gasification plant under construction. $1.2 billion. Contractor: Krupp Koppers. Completion: 1987.

SWEDEN

NYNÄS ENERGY CHEMICALS COMPLEX AB. (A. Johnson & Co., Sveriges Investeringsbank AB, AGA AB, Superfos a/s). **Nynashamn.** 750,000 t/y coal gasification to 450,000 t/y ammonia. Engineering completed. Project completion: 1988-89.

UNITED KINGDOM

NATIONAL COAL BOARD. Point of Ayr. 2.5 t/d coal liquefaction pilot plant under construction. $50.4 MM. Contractor: Babcock Woodall-Duckham. Completion: late 1987.

Pipelining—WORLDWIDE CONSTRUCTION

*Designates projects listed for the first time in the Journal.

U.S. CRUDE LINES

***AMOCO PIPELINE.** 3 miles, 4-in. Teche in New Charenton Field, La. Completion: Nov. 1986.

CELERON PIPELINE. 1,768 miles, 30-in. from Santa Barbara, Calif. to McCamey, Tex. under construction. Contractor: American West, Willbros Energy Services, Gregory & Cook. $840 MM. Completion: early 1987. (1,250 miles completed).

***DOE.** 25.2 miles, 35-in. from Sun terminal, Nederland, Tex. to Big Hill, Winnie, Tex. Contractors: M. Curran. Completion: Sept. 1987.

PACIFIC TEXAS PIPELINE. 1,030 miles, 42-in. from Port of Los Angeles, Calif. to Midland, Tex. under construction. $1.6 billion-1984. Contractors: Stearns Catalytic, Potashnick, Morrison-Knudson, Hood, Southeast Pipeline, Bredero Price. Completion: late 1987.

POINT ARGUELLO PIPELINE. 14 miles, 24-in. from Gaviota, Calif. to Point Arguello, Calif. Contractor: Hood Corp. Completion: Feb. 1987.

SOUTHERN CALIFORNIA PIPELINE SYSTEM. (Chevron (project manager), Four Corners Pipeline, Shell, Texaco).

Los Padres Pipeline: 130 miles, 30-in. from Gaviota, Santa Barbara County, Calif. to Emidio, Kern County, Calif. $350 MM. Planned. Completion: mid 1988.

Angeles Pipeline: 130 miles, 30-in. from Emidio, Kern County, Calif. to Los Angeles Basin refineries. Planned. Completion: mid 1988.

***TOTAL PIPELINE CORP.** 27 miles, 8-in. from Ponca City, Okla. to Arkansas City, Kans. Pending. Completion: Spring 1987.

4 miles, 10-in. in Ardmore, Okla. under construction. Completion: Fall 1986.

U.S. PRODUCT LINES

***AMOCO PIPELINE.** 25 miles, 12-in. products line from Whiting, Ind. to Laplata, Mo. (crude conversion to products line for delivery to Wood River, Ill. and Sugar Creek, Mo.). Contractor: Mid-Western. Completion: Dec. 1986.

***COLONIAL PIPELINE.** 11.5 miles, 8-in. from Apex, N.C. to Raleigh-Durham Airport, N.C. Engineering stage. Completion: May 1987.

***DOE.** 19.5 miles, 48-in. Big Hill strategic petroleum reserve near Winnie, Tex. Contractor: Gregory & Cook with Associated. Completion: Jan. 1987.

***MID-AMERICA PIPELINE.** 113 miles, 8⅝-in. from Morris, Ill. to Tuscola, Ill. Planned. Completion: Sept. 1987.

10 miles, 6⅝-in. in Uinta County, Wyo. Planned. Completion: July 1987.

22 miles, 10¾-in. in Uinta County, Wyo. under study. Completion: 1987.

Loops on existing Rocky Mountain pipeline from Sweetwater County, Wyo. to San Juan County, N.M. under study. Completion: 1987.

SHELL OIL. 146 miles, 16-in. or 20-in. CO_2 line from McComb, Miss. to Weeks Island, La. Completion: early 1987.

***SOUTHERN PACIFIC PIPELINES.** 23 miles, 12-in. from Sacramento, Calif. to Roseville, Calif.

10 miles, 10-in. from Roseville, Calif. to Reno. Nev.

257 miles, 20-in. from Colton, Calif. to Phoenix, Ariz.

TEXAS EASTMAN. 130 miles, 6 and 8-in. from Longview, Tex. to Tyler, Tex. on to Shreveport, La. Eng-const: Ford, Bacon, Davis.

U.S. GAS LINES

***ANR PIPELINE and CONSUMERS POWER.** 13.5 miles, 20-in. from Ypsilanti, Mich. to Northville, Mich. (Washtenaw line). Before Ferc.

***ANR PIPELINE and TRANSCO.** 379 miles, 30-in. from Defiance, Ohio to Leidy, Penn. (Erie line). Before Ferc.

ARKANSAS LOUISIANA GAS. 112 miles, 30-in. from Clark County, Ark. to Ouachita, Parish, La.

23 miles, 30-in. loop in Logan and Yell counties, Ark.

16 miles, 30-in. loop from Chambers station, Yell County, Ark. to Hot Springs, Ark.

48 miles, 36-in. loop in Latimer County, Okla.

34 miles, 30-in. loop between Perla and Hot Springs, Ark.

10 miles, 24-in. loop in Columbia County, Ark.

Total cost: $232.2 MM. Completion: late 1987.

***CANADIAN GATEWAY PIPELINE SYSTEM** (Consolidated Natural Gas Co. and Texas Eastern Transmission Corp.). 142 miles, 30-36-in. from Marilla, NY to New York City area. Before Ferc. Completion: Nov. 1988.

***COLUMBIA GULF TRANSMISSION.** 1.9 miles, 8-in. in Vermilion Parish, La. Planned. Completion: Fall 1986.

2 miles, 8-in. in Eugene Island Block 308. Planned. Completion: Fall 1986.

CONSUMERS POWER. 22 miles, 2-4-in. in Northern lower Michigan. Completion: April 1987.

3 miles, 2-4-in. in Southern lower Michigan. Completion: April 1987.

EAST TENNESSEE NATURAL GAS. 33 miles, 12-in. from Nora, Va. to Abingdon, Va.

EL DORADO INTERSTATE TRANSMISSION (Lear Petroleum Corp. and TransCanada Pipelines Ltd.). 263 miles, 42-in; 47 miles, 30-in; 35 miles, 24-in. from Needles, Calif. and Topock, Ariz. to Bakersfield area, Calif. under construction. $285 MM. Completion: 1987.

ENRON CORP. 51 miles, 24-30-in. and 268 miles, 4-30-in. Florida Gas Transmission line from Baton Rouge, La. to Ft. Lauderdale, Fla. Before Ferc. Completion: Jan. 1987 and June 1988.

GREAT LAKES TRANSMISSION. 350 miles, 36-in. loops from Emerson, Man., through Minnesota, Wisconsin, and Michigan to St. Clair, Mich. Before Ferc. $341.7. Start const: 1987. Completion: 1989.

***HADSON GAS SYSTEMS.** Caddo, Canadian, Oklahoma counties to Smith cogen plant. $7 MM. Construction start: 1987. Completion: 1988.

HOUSTON PIPELINE. 450 miles, 30-in. crude line conversion to gas under way. Contractors: Halliburton, Reading & Bates, Hinkles & McCoy.

15 miles, 24-in. in Matagorda area, Tex. Planned. Completion: late 1986.

KERN RIVER GAS TRANSMISSION. (Williams Cos. and Tenneco). 762 miles, 36-in. from Kemmerer, Wyo. to Bakersfield, Calif. Proposed. $800 MM. Construction start: 1987. Completion: 1988.

***MANTARAY TRANSMISSION.** (Panhandle Eastern Corp. and Texas Eastern Transmission). 33.5 miles, 20-in. from Matagorda Field (offshore Gulf of Mexico) to Calhoun County, Tex. Before Ferc. Completion: 1987.

MICHIGAN CONSOLIDATED GAS. 25.2 miles, 10¾-in. and 6.8 miles, 6⅝-in. mainline extension from Forest township, Cheboygan County to Pulawski township, Presque Isle County, Mich. Before Ferc.

MOBILE BAY. (ANR and United Gas Pipeline). 23 miles, 30-in. from UGPL 12 and 30-in. Mobile Bay, Ala. to Mobil's Mary Ann field, Ala. $17 MM.

MOJAVE PIPELINE. (Enron Corp. and El Paso Natural Gas). 383 miles, from San Ardo, Calif. to Needles station near Topock, Ariz. (Lateral to Kern County, Calif.). $250 MM. Proposed.

***MONTANA POWER.** 90 miles, 16-in. from Cut Bank, Mont. to Helena, Mont. Contractor: Morrison-Knudsen. Completion: April 1987.

NATURAL GAS PIPELINE CO. OF AMERICA. 235 miles, 42-in. from Carter County, Okla. to Cass County, Tex. Ferc filed.

52.5 miles, 36-in.; 87.5 miles, 42-in.; 22 miles, 24-in. Beckham, Carter, and other Oklahoma Counties. Before Ferc.

146 miles from Ventura to mainline system at Harper, Iowa. Proposed. Construction start: 1986.

***NORTHERN BORDER PIPELINE.** 396 miles, 36-in. mainline extension from Ventura, Iowa, to Chrisman, Ill. Before Ferc. $374 MM.

NORTHERN NATURAL GAS. 8 miles, 12-in. in Refugio County, Tex. Before Ferc. Completion: Nov. 1986.

OHIO INTERSTATE PIPELINE. (ANR and Northern Natural Gas). 373 miles from Defiance, Ohio to Leidy, Clinton County, Pa. Proposed. Construction start: 1986.

***OKLAHOMA NATURAL GAS.** Before Ferc:

1 mile, 8-in. F223 to FM 23. Completion: Dec. 1986.

3 miles, 6-in. AM 358. Completion; Jan. 1987.

1 mile, 12-in. Line Q. Completion: March 1987.

2 miles, 8-in. AM 72. Completion: March 1987.

PACIFIC GAS TRANSMISSION. 431 miles, 42-in. looping Angts western leg: Idaho, Washington, Oregon. Planned.

***PANHANDLE EASTERN PIPELINE.** 17 miles, 22-in. on Sneed line from Hutchinson Co., Tex. to Hansford Co., Tex. Planned. Completion: Spring 1987.

PEOPLES NATURAL GAS. 8 miles, in Allegheny County, Pa. under construction. Co. crews. Completion: Dec. 1986.

POINT ARGUELLO NATURAL GAS LINE. 14 miles, 20-in. from Gaviota, Calif. to Point Arguello, Calif. Contractor: Hood. Completion: Feb. 1987.

***SOUTHERN CALIFORNIA GAS.** 7.5 miles, 36-in. from Carson, Calif. to Redondo Beach, Calif. Bids out. Completion: Dec. 1986.

SOUTH JERSEY GAS. 16 miles, 20-in. from Vineland, N.J. to Mays Landing, N.J. Design stage. Completion: Jan. 1987.

***TENNESSEE GAS PIPELINE.** 175 miles, 26-in. and 54 miles, 30-in. on Kentucky lines under way. Contractor: TGP crews, Murphy Bros., Carl E. Smith. Completion: late 1986.

***TEXAS EASTERN GAS PIPELINE.** 21 miles, 36-in. in Huntingdon and Juniata Counties, Pa. under construction. Contractor: Welded. Completion: Fall 1986.

TEXAS EASTERN TRANSMISSION CORP.

59 miles, 30-in. and 40 miles, 36-in. loops from Connellsville, Pa. to Lambertville, N.J.

LOOPS UNDER CONSTRUCTION:

2 miles, 36-in. Perulack, Pa., to Bechtelsville, Pa.

3 miles, 24-in. Leidy, Pa. to Perulack, Pa.

1 mile, 42-in. Lambertville, N.J. to Linden, N.J.

29 miles, 36-in. Berne, Ohio to Bechtelsville, Pa.

7 miles, 42-in. Lambertville, N.J. to Linden, N.J.

6 miles, 36-in. Berne, Ohio to Bernville, Pa.

3 miles, 42-in. Lambertville, N.J. to Linden, N.J.

7 miles, 36-in. Connellsville, Pa. to Bechtelsville, Pa.

2 miles, 42-in. Lambertville, N.J. to Linden, N.J.

4 miles, 26-in. Crooksville, Ohio to Sarahsville, Ohio.

6 miles, 36-in. Athens, Ohio to Delmont, Pa.

28 miles, 24-in. Leidy, Pa. to Perulack, Pa.

10 miles, 30-in. Perulack, Pa. to Bechtelsville, Pa.

10 miles, 36-in. Armagh, Pa. to Bernville, Pa.

***TEXAS GAS TRANSMISSION CORP.**

Planned lines to be completed in 1986:

2 miles, 8-in. from Block 308 to Block 309 Eugene Island.

3 miles, 10-in. from Block 297 to Block 296 Eugene Island.

2 miles, 6-in. from Block 349 to Block 342 Eugene Island.

***TRANSCONTINENTAL GAS PIPELINE CORP.** 6 miles, 8-in. from Eugene Island 113-A to Eugene Island 135 under construction. Completion: Nov. 1, 1986.

***TRANSCO OFFSHORE GATHERING.** 18 miles, 24-in. from South Timbalier 292 to ST 300 under construction. Contractor: Brown & Root. Completion: Nov. 1, 1986.

TRANSWESTERN PIPELINE. 58.9 miles, 20-in. and 21.1 miles, 12-in. from Hemphill County, N. M. to Roger Mills County, Okla. Before Ferc.

TRANSYLVANIA GAS PIPELINE CL. Leidy loops:

26 miles, 36-in. Luzerne County, Pa. Completion: 1987.

8 miles, 30-in. Clinton County, Pa. Completion: 1987.

21 miles, 36-in. Northampton and Monroe Counties, Pa. Completion: 1987.

17 miles, 36-in. Hunterdon and Warren Counties, NJ. Completion: Dec. 1986.

4 miles, 36-in. Caldwell loop, Morris and Essex Counties, NJ. Completion: 1987.

3 miles, 24-in. Trenton Woodbury loop, Mercer County, NJ. Completion: Dec. 1986.

***TRUNKLINE GAS.** 4 miles, 10-in., from Ewing Bank 305 to Grand Isle 77 in engineering stage. Completion: Nov. 1986.

2 miles, 24-in. in Montgomery Co., Tex. Planned. Completion: 1987.

YUKON PACIFIC CORP. 820 miles from Prudhoe Bay to Kenai Peninsula. $26.6 billion-1983. Proposed. (Connect with Angts at Fairbanks).

COAL LINES

U.S.S.R.

161 miles, 21-in. coal slurry line from Belovo, Siberian coal fields to Novosibirsk. Snamprogetti Reocarb process. Contractor: Snamprogetti. $268 MM. Completion: end 1988.

ALGERIA

SONATRACH. 344 miles, 48-in. gas line from Hassi R'Mel to Oued as Safsaf under construction. Contractor: Saipem. Completion: June 1987.

ARGENTINA

GAS DEL ESTADO.

GAS LINES PLANNED FOR COMPLETION IN 1988:

174 miles, 18-in. from Santa Fe, Argentina to Montevideo, Uruguay.

GAS LINES PLANNED FOR COMPLETION IN 1987:

420 miles, 30-in. from Bahia Blanca to Buenos Aires.

295 miles, 12-in. from Mendoza to Santiago de Chile.

GAS LINES PLANNED FOR COMPLETION IN 1986:

360 miles, 30-in. from Neuquen to Bahia Blanca.

118 miles, 10-in. from Pilar to San Francisco.

25 miles, 16-in. and 8 miles, 12-in. from main line to Cordoba.

110 miles, 12-8-in. from San Nicolas to Bragado.

PRODUCTS LINE:

360 miles, 10-in. from Loma la Lata to Puerto Galvan. Completion: 1987.

PETROQUIMICA AUSTRAL. 47 km, 10-in. from gas fields to La Mision, Tierra del Fuego methanol plant. Completion: early 1987.

AUSTRALIA

CSR LTD. 373 miles gas gathering and trunk lines from Denison Trough field to Gladstone. $100 MM.

SECWA. 110 miles, 6-in. gas line from Gascoyne Junction to Carnarvon. Start: Dec. 1986. Completion: June 1987.

AUSTRIA

***OESTERREICHISCHE MINERALOELVERWALTUNG.** 26 miles, 42-in. gas line from Grafendorf to St. Margarethen. Contractor: Mannesmann. Completion: Aug. 1987.

102 miles, 42-in. gas line from Goggitsch to Arnoldstein. Contractor: Saipem. Completion: May 1988.

BOLIVIA

YPFB and PETROBRAS. 343 miles, 30-in. from Santa Cruz to Sao Paulo, Brazil. Basic design-eng: Snamprogetti.

BRAZIL

PETROBRAS. 62 miles, 18-in. gas line from Reduc-Rio de Janeiro to Volta Redonda, RJ. Under study. Completion: 1986.

109 miles, 8-in. gas line from Asfor-Ceara to Fazenda Belem, Ceara. Under study. Completion: 1986.

PETROBRAS and YPFB. 822 miles, 28-in. gas line from Santa Cruz, Bolivia to Sao Paulo. Basic engineering: Snamprogetti.

CANADA

CRUDE LINES

***CONSUMERS GAS CL.** 16.8 miles, 36-in. in Toronto under construction. Contractor: Banister. Completion: Fall 1986.

ESSO RESOURCES CANADA LTD. 1,400 miles, 42-in. from Richards Island west of Tuktoyaktuk, Beaufort Coast to northern Alberta. Planned.

INTERPROVINCIAL PIPELINE LTD. 337 miles, 20-in. from Regina, Sask. to Gretna, Manitoba under construction. Contractor: Pe Ben on Spread 3. Completion: Fall 1986.

PANCANADIAN PETROLEUM LTD. (Blackfoot Pipeline System). 100 miles, 10-in. from Edmonton, Alta., to Portland, Ore. Planned.

PRODUCT LINES

FEDERATED PIPELINES. 145 miles, 8-16-in. from Swan Hills, Alta. to Edmonton, Alta.

Awaiting ERCB approval. (HVP Transportation System, Swan Hills miscible flood pipeline conversion).

GAS LINES

BC HYDRO. From Roberts Bank, s of Vancouver—through strait of Georgia—to Nanaimo n of Victoria, B.C. Approved. $223 MM.

CANADIAN WESTERN NATURAL GAS. 30 miles, 10-in. from Taber to Bow Island, Alta. under construction. Completion: 1986.

16 miles, 4-in. from Taber to Wrentham, Alta. under construction. Completion: 1986.

9 miles, 6-in. and 20 miles, 4-in. from Foremost to Bow Island, Alberta. Planned. Completion 1987.

13 miles, 8-in. from Red Deer to Nevis, Alberta. On hold. Completion: 1988.

28 miles, 24-in. from Beiseker to East Calgary. Planned. Completion: 1990.

NOVA. 90 miles, 4-in. to 12-in. and 140 miles, 3-in. to 12-in. all in Alberta. Completion: 1986.

PEACE PIPELINE LTD. 144 miles from Grande Prairie region, nw Alberta to Peace Pipelines at Fox Creek. Approved.

POLAR GAS. 1,318 miles, 36-in. from Canada's High Arctic (Mackenzie Delta/Beaufort Sea) to Edson, Alberta. Filed with NEB. $3.4 Can. billion-1984. Completion: mid 1990's.

SABLE GAS SYSTEMS (TransCanada Pipelines, Nova Scotia Resources). 490 miles 26-in. from Sable Island through Nova Scotia and New Brunswick to Maine Border. Proposed.

***SASKATCHEWAN POWER CORP.** 11 miles, 3-in; 30 miles, 3-in; 67 miles, 4-in. in Saskatchewan under construction. Contractor: Midwest Pipeline. Completion: 1986.

60 miles, 1.5-in; 60 miles, 2-in. in Saskatchewan under construction. Contractor: Hundseth. Completion: 1986.

***WESTCOAST TRANSMISSION CL.** 20 miles, 10-in. from Sikanni line to gathering system. Completion: Nov. 1986.

CHINA

*620 miles, 24-in. gas line from Yacheng field, Hainan Island to Guangdon Province, Guangzhou, south to Hong Kong. Feasibility study: Fluor Daniel PRC Ltd.

*Qiong Zhou Strait crossing (Yacheng, Hainan, Hong Kong gas line). Joint study by: China National Offshore Oil Corp. and J.P. Kenny, London.

155 mile crude line from Shengli field to Huangdao, Shandong province. Eng-construction: Novacorp International.

230 mile gas line from Zhongyaun, Henan Province to Cangzhou, Hebei Province. Contractor: Novacorp International.

CHINA, TAIWAN

CHINESE PETROLEUM CORP. 9 miles, 30-in; 176 miles, 26-in; 33 miles, 24-in. gas line from Yuan-An LNG receiving terminal to Hsinchu and Kaohsiung under construction. Contractor: BES. Eng. Completion: Dec. 1990.

COLOMBIA

ECOPETROL.

CRUDE LINES PROPOSED:

100 miles, 14-in. and 50 miles, 12-in. from San Cayetano to Velasquez.
Completion: Jan. 1988.

118 miles, 20-in. from Ayacucho to Barrancabermeja. Completion: March 1987.

PRODUCTS LINES PLANNED:

18 miles, 6-in. from Medellin to Rionegro.

81 miles, 6-in. from Facatativa to Villavicencio.

20 miles, 12-in. from Sebastopol to Medellin.

GAS LINE PLANNED:

58 miles, 20-on. from Dibulla to Ballenas.

CRUDE LINES UNDER CONSTRUCTION:

30 miles, 10-in; 60 miles, 12-in; 40 miles, 14-in. from Araguaney to San Cayetano. Contractors: Const. Protexas and Techint-Arinco. Completion: Dec. 1986.

CZECHOSLOVAKIA

534 miles, 56-in. from Waidhaus, West Germany to Uzhgorod, USSR. Completion: 1988.

DENMARK

DONG A/S. 40 miles, 14-in. gas line from Lille Torup to Aalborg. Detailed design. Completion: June 1987.

12-in. gas line from Silkeborg to Skjoldelev. Completion: Dec. 1986.

EGYPT

***CONTINENTAL PIPELINE.** 9 miles, 16-in. from Salam, Western Desert to Meleiha, Western Desert under construction. Contractors: Petrojet GmBH. Completion: Nov. 1986.

PETROLEUM PIPELINES. $400 MM Sumed expansion under construction. Snamprogetti.

FRANCE

***STE. DU PIPELINE MEDITERANEE-RHONE.** 94 miles, products line from La Mede (Bouches-du-Rhone) to Puget-sur-Argens (Var). Eng. study: OTP.

GERMANY

GASVERSORGUNG SÜDDEUTSCHLAND GmbH. 9.3 miles, 10-in. gas line from Aalen to Schwaebisch Gmuend under construction. Co. crews. Completion: Fall 1986.

MEGAL. 18 miles, 43-in. gas line from Waidhaus to Rothenstadt. Contractor: Pipeline Eng. Completion: Nov. 1986.

32 miles, 43-in. gas line from Rollfeld to Gernsheim. Contractor: Pipeline Eng. Completion: Nov. 1986.

***RUHRGAS AG.** 24 miles, 28-in. gas line from Steinbrink to Hobbensen. Planned. Contractor: Pipeline Eng. Completion: 1986.

16 miles, 32-in. gas line from Epe to Wettringen. Planned. Contractor: Pipeline Eng. Completion: 1988.

6 miles, 12-in. gas line from Giessen to Wissmar under construction. Contractor: Pipeline Eng. Completion: 1986.

HUNGARY

GÁZ-ÉS OLAJSZÁLLITÓ VALLALAT. 71 miles, 16-in gas line from Lengyeltoti to Gellénhaza. Design stage. Contractor: Olajterv. Completion: 1987.

27 miles, 24-in. gas line from Pilisvorosvar to Szazhalombatta. Design stage. Contractor: Olajterv. Completion: 1987.

78 miles, 28-in. gas line from Beregaroc to Hajduszoboszlo. Design stage. Contractor: Olajterv. Completion: 1988.

INDIA

NATIONAL GAS & PIPELINES CORP. 994 miles, 36-18-in. gas line from Bombay High to six (future) fertilizer plants. Route: Bombay High to Hazira to Jhabua to Bajaipur, (spur to Anta and Sawai Madhopur), to Auraiya (spur to Jagdishpur), to Shahjahanpour to Aonla to Babrala. $1.7 billion. Contractors: Spie-Capag, Nippon Kokan, Toyo Eng. Completion: July 1989.

IRAN

NIOC. 63.7 miles, 56-in. crude line from Gach Saran to Noorabad under construction. Contractor: Saipem. Completion: Dec. 1986.

IRAQ

BOTAS. Crude lines from Kirkuk to the Turkish border under construction:

35 miles, 30-in; 348 miles, 46-in. Turkish section: from Iraqi border to Ceyhan marine terminal. Contractor: Tekfen, Kutlutas, Saipem. Completion: May 1987.

SCOP. 27 miles, 28-in; 27 miles, 34-in; 140 miles, 46-in. Iraqi section: from Kirkuk to Turkish border. Contractors: Saipem, Tekfen-Kutlutas-Turkey. Completion: May 1987.

31 miles, 56-in. crude line. IPSA Phase 2: Advanced portion on the EWP corridor. Contractor: Mannesman. Completion: Dec. 1986.

ITALY

***SNAM SpA**

GAS LINES UNDER CONSTRUCTION:

NORTH-WEST AREA

10.9 miles, 20-in. from Oviglio to Nizza Monferrato. Contractor: Sicim. Completion: Nov. 1986.

SOUTH AREA

7.8 miles, 24-in. loop from Sparacollo to Carcaci. Contractor: Sicilmontaggi. Completion: Dec. 1986.

18.2 miles, 20-in. loop from Ferrandina to Altamura. Contractor: Unione. Completion: Jan. 1987.

21 miles, 10-in. to Senise. Contractor: Unimont. Completion: Jan. 1987.

27.3 miles, 12-8-6-in. to Laviano-Pescopagano-Ruvo del Monte-Bella. Contractor: Sicilmontaggi. Completion: Nov. 1986.

16 miles, 8-6-4-in. to Marsico Nuovo-Marsico Vetere. Contractor: Edilban. Completion: Jan. 1987.

25.2 miles, 12-4-3-in. to Bisaccia-Lacedonia. Contractor: Tre Emme. Completion: Feb. 1987.

GAS LINES IN ENGINEERING STAGE:

102 miles, 42-in. loop of USSR import line. Completion: Sept. 1988.

NORTH-WEST AREA

17 miles, 16-6-3-in. to Mondori-Ceva. Completion: May 1987.

9.3 miles, 12-8-in. to Pinerolo-Perosa Aregentina. Completion: April 1987.

10.2 miles, 20-6-in. to Arenzano-Cogoleto. Planned.

11 miles, 20-in. loop from Nizza Monferrato to Ponti. Completion: Nov. 1987.

10 miles, 24-16-in. from Cesano Maderno to Rho-Bollate. Completion: Nov. 1987.

25 miles, 26-in. from Poirino to Chivasso. Completion: Nov. 1987.

NORTH-EAST AREA

13.5 miles. 10-in. from Bolzano to Merano. Planned.

SOUTH AREA

15.2, 16-12-in. to Reggio Calabria. Completion: Apr. 1987.

23 miles, 26-24-in. second feeder to Napoli. Completion: Dec. 1987.

JORDAN

580 miles, 41-in. crude line from Al Haditha, northwest Iraq to Aqaba, Jordan. Planned. $l billion. $500 MM-equipment. Bechtel. Completion: 1986.

KENYA

***KENYA PIPELINE CL.** Products line from Nairobi to Kampala. Feasibility study.

KOREA

68 miles, 20-24-in. gas line. Part of a $130 MM project for a gas feeder pipeline system to join a pipeline from LNG facilities at Pyeong Taek to Inchon.

MALAYSIA

PETRONAS. 375 miles, 24-36-in. crude line. Planned.

MEXICO

PEMEX.

CRUDE LINES

39 miles, 16-in. from Imuris to Canonea. Contractor: Spie Capag.

31 miles, 36-in. from Nuevo Teapa, Ver. to Salina Cruz, Oax. Planned. (First phase. Total length: 168 miles). Completion: 1986.

PRODUCTS LINES

186 miles, 12-in. from Guadalajara, Jal to Tepic, Nay. Planned. Completion: Dec. 1988.

215 miles, 16-in. products line Naco to Hermosillo. Planned. Completion: Dec. 1989.

199 miles, 14-in. from Guadalajara to Manzanillo. Planned. Completion: Dec. 1989.

34 miles, 8-in. from Degollado, Mich. to Zamora, Mich. Planned. Completion: Dec. 1987.

From Queretaro to San Luis Potosi. Planned. Completion: Dec. 1989.

GAS LINES

47 miles, 24-in. from Venta de Carpio to Los Remedios. Planned. Completion: 1986.

62 miles, 36-in. from Pemex Tabasco to Cactus, Chis. Planned. Completion: 1986.

155 miles, 24-in. from Jaltipan, Ver. to Salina Cruz, Oax. Planned.

MOROCCO

OFFICE D'EXPLOITATION DES PORTS. Mohammedia harbor extensions under construction by OTP to be completed 1986:

4 miles, 36-30-in. crude line.
1 mile, 20-in. LPG line.
3 miles, 14-in. heavy fuel line
3 miles, 14-in. naphtha line
3 miles, 12-in. gasoline line.

NEW ZEALAND

***PETROCORP.** 37 miles, 4-in. gas line from Reporoa to Taupo. Planned. Completion: March 1987.

18 miles, 4-in. gas line from Edgecumbe to Whakatane under construction. Completion: Nov. 1986.

64 miles, 4-in. gas line at Wairarapa. Planned.

NIGERIA

NIGERIAN NATIONAL PETROLEUM CORP. 90 miles, 6-8-12-16-in. gas lines from West Niger Delta via Warri to Lagos. Consult: Pencol. Contractor: Mannesmann-Imeg. Completion: 1988.

50 miles, 30-in. gas line from West Niger Delta via Warri to Lagos. Consult: Pencol. Completion: 1988.

215 miles, 36-in; 10 miles, 30-in; 11.2 miles, 24-in. gas lines from West Niger Delta via Warri to Lagos. Consult: Pencol. Contractor: Saipem-Snamprogetti. Completion: 1988.

*375 miles, 16-14-12-in. products lines from Port Harcourt to Aba, Enugu, Auchi, Benin, Ore. Completion: Dec. 1988.

NORWAY

ELF AQUITAINE NORGE AS. 10 miles, 18-in. gas line from East Frigg field to Frigg TCP 2 Platform. Planned. Contractor: OTP. Completion: 1987.

TOTAL OIL MARINE. 70 miles, 24-in. gas line from Alwyn field to Frigg field under construction. Contractor: OTP. Completion: 1986.

10 miles, 12-in. crude line from Alwyn field to Ninian field. Completion: 1986.

OMAN

PETROLEUM DEVELOPMENT OMAN. Five crude and gas lines: Yibal, Huwaisah, Karn Alam, Nahada, Jahama, Bar under construction. 82.5 miles, 6-36-in. Contractor: Saipem with Consolidated Contractors. Completion: Jan. 1987.

PAKISTAN

SUI NORTHERN GAS PIPELINES. 150 miles, 18-in. gas line from Multan to Faislabad. Completion: 1988.

120 miles crude line from Tando Alam field to Karachi refineries. Completion: 1988.

QATAR

QATAR GENERAL PETROLEUM CORP. 75 miles, 12-in. and 3 miles, 8-in. gas liquids pipeline in design stage.

SAUDI ARABIA

ARABIAN AMERICAN OIL. 387 miles, 56-in. crude line loops from Abqaiq to Yanbu. Contractor: Saudi Saipem. Completion: March 1987.

375 miles, 56-in. from eastern oil fields to Yanbu. $80-90 MM. Contractors: Mannesmann and Consoldiated Contractors. Completion: April 1987.

SOUTH AFRICA

GASKOR. 10 miles, 8-in. gas line from Johannesburg to Lenasia. Contractor: Pelican Pipelines.

25 miles, 12-in. and 40 miles, 10-in. gas lines from Boksburg-Benoin to Kempton Park. Contractor: Pelican Pipelines.

SASOL. 150 miles, 8-in. gas line from Sasolburg to Secunda. Contractor: Pelican Pipelines.

SPAIN

***CAMPSA.** 65 miles, 12-in. and 66 miles, 8-in. products lines from Tarragona to Barcelona and Gerona. Engineering stage. Contractor: Heredia y Moreno. Completion: 1988.

***CATALANA DE GAS Y ELECTRICIDAD.** 20 miles, 12-in; 10 miles, 10-in; 25 miles, 8-1-in. gas lines from Barcelona to Manresa. Engineering stage. Contractor: Heredia y Moreno. Completion: 1987.

TANZANIA

TAZAMA PIPELINES LTD. 1,060 miles, 8-12-in. from Dar Es Salaam, Tanzania to Ndola, Zambia. Design: Pencol Eng. Completion: 1987.

TURKEY

***BOTAS.** 496 miles, 18-36-in. from USSR gas fields via Bulgaria to Istanbul and Ankara under construction. $300 MM. Turnkey: Spie-Capag. Eng: Fluor. Offshore (Sea of Marmara): Brown & Root. Completion: Sept. 1988.

Extension of 496-mile gas line from Ankara to Izmir. Proposed.

Crude lines from Kirkuk to the Turkish border under construction:

35 miles, 30-in; 348 miles, 46-in. Turkish section: from Iraqi border to Ceyhan marine terminal. Contractor: Tekfen, Kutlutas, Saipem. Completion: May 1987.

SCOP. 27 miles, 28-in; 27 miles, 34-in; 140 miles, 46-in. Iraqi section: from Kirkuk to Turkish border. Contractors: Saipem, Tekfen-Kutlutas-Turkey. Completion: May 1987.

UNITED KINGDOM

***BRITISH GAS CORP.** 23 miles, 36-in. gas line from Theddlethorpe to Hatton. Planned. Completion: Sept. 1988.

MARATHON OIL U.K. LTD. 7½ miles, 18-in. from Brae Platform A to B, North Sea. Contractor: Brown & Root UK. $5.5 MM.

U.S.S.R.

GOVERNMENT. 411 miles loops from Gazli, Uzbekistan east to Chimkent, Kazakhstan. Completion: 1987.

186 miles, gas line from Mozdok to Tbilisi, Georgia under construction.

2,860 miles, 56-in. Progress gas line from Yamburg field to USSR western border. (Gas will be suppied to eastern European Communist countries also). Completion: 1987.

VENEZUELA

***MARAVEN SA.** Sumandes products line from San Lorenzo, Lake Maracaibo to El Vigia and Tachira (Andes). Planned. $213 MM. Completion: 1990.

YEMEN, NORTH

YEMEN HUNT OIL. 273 miles, 24-26-in. crude line from Alif field to Red Sea. $500 MM. Bids out. Completion: 1987.

YEMEN OIL & MINERAL RESOURCES CORP. 40 km, 10-in. and 238 km, 8-in. products lines from Salif to Sanaa. Completion: late 1987.

ZAMBIA

TAZAMA PIPELINES LTD. 1,060 miles, 8-12-in. from Dar Es Salaam, Tanzania to Ndola, Zambia. Design: Pencol Eng. Completion: 1987.

OGJ REPORT

PIPELINE ECONOMICS Report

Current pipeline costs

Size, in.	Location	Length, miles	Cost, $ Material	Labor	Misc.*	R.O.W. & damages	Total	$/mile
ONSHORE PIPELINES								
4	Nebraska	1.5	234,899	20,163	13,170	2,038	270,270	180,180
6	Colorado	15.1	360,000	356,000	85,000	69,000	870,000	57,616
8	Nebraska	2.0	312,651	26,837	17,530	2,712	359,730	179,865
8	Arizona-Calif.	3.9	218,000	278,000	150,000	110,000	756,000	193,846
8	Wisconsin	18.2	817,000	1,317,000	773,296	280,000	3,187,296	175,126
8	Mississippi-Ark.†	30.0	1,070,800	1,792,000	842,200	406,000	4,111,000	137,033
10	Indiana	19.5	980,000	1,500,000	750,000	1,070,000	4,300,000	220,513
12	Kansas§	0.3	14,000	22,000	8,854	11,000	55,854	186,180
12	Massachusetts¶	1.4	177,000	857,000	186,637	238,000	1,458,637	1,041,884
12	Indiana	8.0	1,066,400	5,609,000	2,667,000	268,450	9,610,850	1,201,356
12	Arizona-Calif.	9.4	766,000	1,280,000	568,000	266,000	2,880,000	306,383
12	Connecticut-N.Y.	26.0	2,750,000	5,460,000	3,563,708	1,710,000	13,483,708	518,604
12	Virginia	32.2	2,553,559	5,597,082	865,865	881,138	9,897,644	307,380
16	Tennessee¶	0.43	104,214	199,907	152,084	4,530	460,735	1,071,477
16	New York§	0.59	83,000	105,000	8,000	4,000	200,000	338,983
16	Oklahoma§	1.5	239,000	164,000	73,000	24,000	500,000	333,333
16	Massachusetts¶	2.5	305,412	1,484,450	324,048	412,306	2,526,216	1,010,486
16	Pennsylvania§	9.23	882,000	1,600,000	82,500	31,700	2,596,200	281,278
16	Tennessee	10.3	1,051,480	1,516,320	584,363	265,200	3,417,363	331,783
16	Tennessee¶	13.25	1,280,000	1,852,800	800,052	70,000	4,002,852	302,102
20	Tennessee§	0.52	150,786	219,153	184,849	5,470	560,258	1,077,419
20	New York§	1.61	225,000	280,000	32,200	31,000	568,200	352,919
20	Louisiana	2.5	400,000	330,000	198,340	120,000	1,048,340	419,336
20	Connecticut	3.0	786,164	1,320,262	615,114	154,934	2,876,474	958,825
20	New York	6.7	992,000	1,563,000	847,085	251,000	3,653,085	545,237
20	New York	8.3	2,382,000	3,345,000	2,074,526	543,000	8,344,526	1,005,365
20	Louisiana§	10.83	2,188,332	4,333,191	1,780,389	415,872	8,717,784	804,966
20	Michigan	13.5	1,283,000	1,561,600	945,026	150,000	3,939,626	291,824
20	Illinois-Wisconsin	17.8	2,050,000	2,593,000	724,000	1,073,000	6,440,000	361,798
20	Oklahoma§	33.0	2,675,000	2,308,000	679,000	113,000	5,775,000	175,000
24	Virginia	0.2	101,106	34,918	5,402	5,497	146,923	734,615
24	Pennsylvania§	0.55	242,900	262,300	70,971	—	576,171	1,047,584
24	Texas	2.5	850,000	500,000	425,000	100,000	1,875,000	750,000
24	New Jersey	3.44	1,237,333	3,102,572	1,008,782	181,665	5,530,352	1,607,660
24	New Mexico¶	5.2	674,000	862,000	233,766	156,000	1,925,766	370,340
24	New York	5.88	1,666,000	2,743,000	1,081,196	686,000	6,176,196	1,064,861
24	New York	7.2	1,587,000	2,375,300	846,681	156,000	4,964,981	689,581
24	Louisiana¶	9.1	1,975,000	1,700,000	669,005	15,000	4,359,005	479,012
24	Penn.-New Jersey	14.0	4,318,979	7,430,943	1,839,046	662,652	14,251,620	1,017,973
24	New Mexico¶	14.6	2,083,000	2,388,000	630,255	88,000	5,189,255	355,428
24	Arizona-Calif.	16.5	2,714,000	2,248,000	1,296,000	305,000	6,563,000	397,758
24	Arizona-Calif.	20.9	3,663,000	3,705,000	1,964,000	593,000	9,925,000	474,880
24	Oklahoma	22.87	4,781,000	3,050,000	1,162,933	297,000	9,290,933	406,250
24	New York	33.5	7,653,200	10,689,200	5,011,983	1,252,300	24,606,683	734,528
24	Connecticut	293.5	77,051,836	129,398,738	60,287,272	15,185,066	281,922,912	960,555
30	Pennsylvania¶	1.0	525,800	672,800	341,348	32,000	1,571,948	1,571,948
30	New York¶	1.0	316,600	666,800	302,245	26,000	1,311,645	1,311,645
30	Pennsylvania¶	1.9	562,900	780,100	398,778	40,000	1,781,778	937,778
30	Pennsylvania¶	1.9	648,200	1,248,300	544,370	43,000	2,483,870	1,307,300
30	New York§	1.99	166,800	108,300	70,681	30,000	375,781	188,835
30	New York¶	2.0	632,800	998,300	466,067	64,200	2,161,367	1,080,684
30	New York¶	4.1	1,328,500	1,753,500	914,904	112,000	4,108,904	1,002,171

Size, in.	Location	Length, miles	Cost, $ Material	Labor	Misc.*	R.O.W. & damages	Total	$/mile
ONSHORE PIPELINES — continued								
30	Massachusetts¶	5.4	1,317,900	3,394,100	1,405,934	259,000	6,376,934	1,180,914
30	Pennsylvania	6.25	2,536,590	4,824,577	1,067,341	156,944	8,585,452	1,373,672
30	New York¶	6.9	1,638,600	2,965,400	1,377,561	155,000	6,136,561	889,357
30	Pennsylvania¶	8.58	2,994,293	3,574,546	1,631,990	192,220	8,393,049	978,211
30	New Mexico¶	14.6	3,177,000	3,089,000	1,561,585	88,000	7,915,585	542,163
30	Penn.-New Jersey	14.75	5,206,624	7,824,418	1,936,425	697,740	15,665,207	1,062,048
30	New Mexico¶	14.9	2,831,000	3,136,000	1,578,350	448,000	7,993,350	536,466
30	New York	29.42	8,719,000	12,020,000	4,483,461	1,100,000	26,322,461	894,713
30	Texas	31.0	8,317,000	4,969,000	2,001,022	703,000	15,990,022	515,308
30	Louisiana	35.0	12,725,000	12,845,000	4,247,635	1,330,000	31,147,635	889,932
30	New Mexico¶	49.3	10,063,000	13,752,000	6,004,229	612,000	30,431,229	617,266
30	Louisiana¶	51.9	19,100,000	18,150,000	5,510,020	85,000	42,845,020	825,530
30	Arizona-Calif.	74.1	19,020,000	15,686,000	9,082,000	2,105,000	45,893,000	619,339
30	Texas-Calif.¶•	357.91	94,589,100	57,088,800	41,793,516	9,769,300	203,240,716	567,854
30	Ohio-Pennsylvania	379.0	97,488,000	107,872,000	45,087,337	19,148,000	269,595,337	711,333
34	New Mexico¶	15.0	3,392,000	3,447,000	1,747,895	288,000	8,874,895	591,660
36	Louisiana†§	0.87	882,251	2,813,500	829,249	55,000	4,580,000	5,264,368
36	California§	3.5	1,350,790	773,300	375,910	—	2,500,000	714,286
36	New Jersey¶	4.13	2,219,444	3,247,631	1,271,301	264,400	7,002,776	1,695,587
36	Minnesota¶	5.1	1,868,600	1,546,400	381,700	56,100	3,852,800	755,451
36	Michigan	8.6	3,478,600	3,002,300	668,300	94,600	7,243,800	842,302
36	Minnesota¶	9.8	3,561,300	3,416,200	747,600	107,800	7,832,900	799,276
36	Minnesota¶	10.9	4,451,200	4,673,700	878,000	119,900	10,122,800	928,597
36	Michigan¶	12.4	5,041,100	4,421,900	136,400	967,600	10,567,000	852,177
36	California§	13.9	5,735,800	3,328,500	1,565,000	—	10,629,300	764,698
36	Wisconsin¶	15.8	5,717,100	4,364,300	1,165,600	173,800	11,420,800	722,835
36	New Jersey¶	17.0	7,977,514	8,882,748	4,045,476	680,000	21,585,738	1,269,749
36	Wisconsin¶	17.1	5,575,000	4,432,000	2,005,850	272,000	12,284,850	718,412
36	Wisconsin¶	17.5	6,840,700	5,344,200	1,325,800	192,500	13,703,200	783,040
36	Penn.-New Jersey¶	21.2	11,268,329	12,625,983	6,728,958	1,670,400	32,293,670	1,523,286
36	Pennsylvania	21.86	10,110,410	16,878,423	3,734,012	549,056	31,271,901	1,430,554
36	Pennsylvania¶	26.1	12,268,221	13,755,149	6,361,316	1,670,400	34,055,086	1,304,793
36	Penn.-New Jersey	48.5	20,622,396	25,731,639	6,368,192	2,294,609	55,016,836	1,134,368
42	Arizona-Calif.	255.7	107,910,000	51,341,000	40,456,000	4,733,000	204,440,000	799,531
Total—onshore projects		**2,370.86**	**$653,171,513**	**$670,825,550**	**$309,727,486**	**$80,052,099**	**$1,713,776,648**	**$722,850**
1985-report total—onshore		**2,283.93**	**$724,032,554**	**$582,929,689**	**$305,589,531**	**$59,725,890**	**$1,672,236,014**	**$732,174**
OFFSHORE PIPELINES								
14	Texas	16	3,180,000	4,900,000	1,555,200	—	9,635,200	602,200
20	Texas§	0.18	88,567	60,625	39,996	—	189,188	1,051,044
20	Conn.-New York	25.0	8,480,000	20,886,000	12,114,379	—	41,480,379	1,659,215
20	Texas	33.5	7,900,000	8,400,000	6,525,000	400,000	23,225,000	693,284
24	Louisiana	18.43	5,765,102	7,765,800	3,591,523	400	17,122,825	929,074
30	Texas	1.35	865,690	591,253	300,106	19,640	1,776,689	1,316,066
30	Texas	1.5	1,128,000	[illegible]307,000	1,024,000	—	4,459,000	2,972,667
Total—offshore projects		**95.96**	**$27,407,359**	**$[illegible]910,678**	**$25,150,204**	**$420,040**	**$97,888,281**	**$1,020,095**
1985-report total		**75.97**	**$15,820,648**	**$22,227,698**	**$16,299,080**	**$1,251,227**	**$55,598,653**	**$731,850**
Total/all projects		**2,466.82**	**$680,578,872**	**$715,736,228**	**$334,877,690**	**$80,472,139**	**$1,811,664,929**	**$734,413**
1985-report total		**2,359.90**	**$739,853,202**	**$605,157,387**	**$321,888,541**	**$60,977,117**	**$1,727,834,667**	**$733,096**

Source: U.S. FERC construction permit applications, June 1, 1985, to June 30, 1986.
* Generally includes engr., supv., surveying, interest, adm. & overheads, contingencies, and FERC fees. † River crossing involved. ¶ Replacement. ¶ Loop. • Consisting of sixteen 30-in. loop projects. Average mileage per project is 22.37 miles; shortest is 4.05 miles, longest, 42.49.

Investment in liquids pipelines

Item	Company and investment, $ A	B	C	D	E	Total, $	Percent
Crude-pipeline investment by five companies							
Land	1,608,562	814,497	294,129	973,472	1,128,935	4,819,595	0.31
Right of way	12,080,048	999,943	316,240	16,176,741	14,829,358	44,402,330	2.83
Line pipe	130,368,131	25,599,112	11,262,596	91,769,793	150,421,182	409,420,814	26.11
Line pipe fittings	8,001,683	903,134	1,754,951	16,939,390	25,611,679	53,210,837	3.39
Pipeline construction	179,734,747	26,692,705	15,622,280	211,308,034	207,989,463	641,347,229	40.90
Buildings	15,436,614	4,813,480	2,513,608	13,407,427	9,026,847	45,197,976	2.88
Boilers	—	—	—	—	—	—	
Pumping equipment	18,996,380	5,499,877	2,414,882	16,669,186	48,327,203	91,907,528	5.86
Machine tools and machinery	—	—	—	33,140	—	33,140	0.002
Other station equipment	70,223,800	17,970,637	4,672,163	43,739,129	23,675,137	160,280,866	10.22
Oil tanks	14,307,556	5,891,602	5,678,530	16,175,510	25,486,950	67,540,148	4.31
Delivery facilities	—	—	5,274,209	2,301,342	6,896,069	14,471,620	0.92
Communications systems	435,867	3,093,553	4,709	10,414,512	3,109,859	17,058,500	1.09
Office furniture and equipment	907,488	191,640	193,089	1,045,591	1,323,775	3,661,583	0.23
Vehicles and other work equip.	6,355,323	1,873,709	466,514	5,698,337	224,040	14,617,923	0.93
Other property	—	—	—	—	49,795	49,795	0.003
Total	458,456,199	94,343,889	50,467,900	446,651,604	518,100,292	1,568,019,884	*100.00
Product-pipeline investment by five companies							
Land	4,260,025	1,763,803	532,035	936,546	3,157,824	10,650,233	0.37
Right of way	28,331,869	10,823,469	18,407,154	8,370,247	7,496,480	73,429,219	2.58
Line pipe	339,549,797	67,582,820	107,106,935	85,500,965	109,480,803	709,221,320	24.91
Line pipe fittings	71,862,081	12,765,202	14,974,034	1,592,054	18,390,783	119,584,154	4.20
Pipeline construction	559,617,944	109,257,117	199,087,690	94,184,328	160,771,495	1,122,918,574	39.45
Buildings	23,331,078	3,921,223	4,543,264	10,258,211	16,877,503	58,931,279	2.07
Boilers	—	—	—	—	—	—	
Pumping equipment	45,748,037	5,920,745	30,691,753	28,183,242	23,177,062	133,720,839	4.70
Machine tools and machinery	—	—	—	—	331,590	331,590	0.01
Other station equipment	116,834,641	20,676,443	36,250,034	23,083,617	92,125,509	288,970,244	10.15
Oil tanks	47,847,703	16,984,594	8,752,431	17,439,636	42,898,586	133,922,950	4.70
Delivery facilities	—	—	9,617,302	10,578,578	40,720,582	60,916,462	2.14
Communication systems	1,067,980	307,639	2,072,088	7,933,574	—	11,381,281	0.40
Office furniture and equipment	9,290,259	1,933,999	1,676,525	549,781	632,342	14,082,906	0.50
Vehicles and other work equip.	5,153,677	1,575,439	6,753,292	2,034,266	1,559,267	17,075,901	0.60
Other property	73,010,348	—	18,629,920	—	—	91,640,268	3.22
Total	1,325,905,439	253,512,493	459,094,457	290,645,005	517,619,826	2,846,777,220	100.00

* Actual total does not equal 100 due to independent rounding. Source: U.S. FERC Form 6, Annual Report of Oil Pipeline Companies, Dec. 31, 1985.

10-year onshore-construction cost trend

		Average cost, $/mile					Range, $/mile	
Size	**Year***	**R.O.W.**	**Material**	**Labor**	**Misc.**	**Total**	**Low**	**High**
8 in.	1986	14,763	44,703	63,102	32,958	155,527	137,033	193,846
	1985	3,141	28,144	47,317	16,283	94,884	64,203	228,866
	1984	22,339	49,974	175,733	74,086	322,132	223,767	540,655
	1983	6,244	48,392	89,600	23,088	167,324	159,940	178,020
	1982	8,996	46,002	67,950	31,769	154,717	73,596	572,926
	1981	8,119	34,860	23,528	20,884	87,391	55,981	109,078
	1980	8,247	39,040	102,839	13,036	163,162	149,926	200,554
	1979	1,189	40,692	63,518	14,951	123,350	50,374	581,916
	1978	1,590	32,123	30,554	8,660	72,927	61,614	109,956
	1977	1,403	34,423	27,002	8,963	71,791	28,844	126,063
12 in.	1986	43,656	94,786	243,533	101,683	483,657	186,180	1,201,356
	1985	26,582	74,620	106,447	46,164	253,813	131,765	767,548
	1984	23,035	147,750	211,783	93,481	476,050	338,872	608,685
	1983	5,135	91,492	73,042	20,754	190,423	177,050	218,265
	1982	10,536	84,972	102,390	32,173	230,071	130,252	669,227
	1981	3,855	71,444	65,613	11,861	152,773	55,981	369,018
	1980	2,610	54,235	41,089	14,111	112,045	78,428	901,282
	1979	1,590	46,062	47,283	7,121	102,056	96,822	158,185
	1978	6,697	55,362	61,919	13,830	137,808	(†)	(†)
	1977	4,332	34,429	22,658	4,573	65,992	53,839	177,694
16 in.	1986	21,474	104,368	183,134	53,546	362,523	302,102	1,071,477
	1985	8,511	80,529	47,708	20,091	156,839	154,746	167,876
	1984	15,106	131,139	111,234	82,747	340,226	231,790	363,718
	1983	31,542	337,088	929,969	278,159	1,576,758	447,890	2,370,748
	1982	6,278	104,319	113,380	21,936	245,913	175,715	430,841
	1981	9,203	110,684	133,968	40,424	294,279	140,674	590,112
	1980	7,404	74,571	57,681	18,050	157,706	118,085	471,972
	1979	....	....	....	....	....	....	....
	1978	7,506	54,936	54,117	12,552	129,111	86,898	203,721
	1977	3,635	50,574	32,260	9,347	95,817	68,897	145,916
20 in.	1986	29,227	134,332	182,623	82,657	428,839	175,000	1,077,419
	1985	108,870	187,379	190,886	144,974	632,109	353,088	1,277,454
	1984	16,735	175,406	190,088	63,302	445,531	226,415	616,250
	1983	12,682	147,354	154,811	46,073	360,934	237,600	476,104
	1982	12,284	124,148	128,148	30,649	295,229	210,378	482,464
	1981	8,556	122,659	114,147	30,370	275,732	227,679	1,741,597
	1980	11,470	130,438	73,751	48,213	263,872	157,947	533,265
	1979	....	....	....	....	....	....	....
	1978	3,235	101,052	83,810	12,346	200,443	153,959	242,685
	1977	5,415	95,045	85,842	16,044	202,346	110,349	312,337
24 in.	1986	43,746	245,807	378,917	170,094	838,565	355,428	1,607,660
	1985	26,648	296,486	305,437	151,657	780,228	469,318	4,893,740
	1984	29,133	289,487	298,521	128,390	745,531	395,676	1,772,049
	1983	31,416	310,583	501,401	148,993	995,393	608,781	1,649,454
	1982	28,537	508,226	807,847	120,895	1,465,505	(†)	(†)
	1981	30,078	269,414	395,204	127,790	822,486	350,898	826,088
	1980	14,220	162,019	152,406	52,114	380,759	230,122	820,295
	1979	5,268	152,878	193,227	19,206	370,579	(†)	(†)
	1978	2,372	112,790	125,435	17,045	257,642	239,480	371,932
	1977	....	....	....	....	....	....	....
30 in.	1986	34,035	268,922	253,838	120,603	677,397	188,835	1,571,948
	1985	60,408	320,219	314,878	152,035	847,541	668,640	5,778,947
	1984	20,885	336,043	376,631	183,034	916,592	637,546	1,413,826
	1983	23,872	253,071	348,478	116,084	741,506	660,086	1,683,143
	1982	20,756	296,737	362,787	93,103	773,383	548,396	1,179,760
	1981	14,135	309,364	201,037	73,281	597,817	561,358	4,684,745
	1980	13,206	227,229	134,491	46,018	420,944	319,482	921,772
	1979	25,884	239,454	290,474	35,752	591,560	529,178	604,298
	1978	12,231	187,718	216,264	20,895	437,108	(†)	(†)
	1977	6,485	147,814	91,862	22,469	268,630	266,513	270,684
36 in.	1986	360,582	428,572	468,960	151,769	1,085,359	714,286	5,264,368
	1985	21,967	389,751	296,742	157,536	865,997	629,179	6,443,590
	1984	36,063	358,876	362,667	152,787	910,393	665,480	2,143,680
	1983	51,436	498,047	490,568	306,666	1,346,717	703,112	2,724,493
	1982	13,429	375,281	176,287	58,733	623,730	615,160	833,546
	1981	5,948	344,374	358,072	74,415	782,809	693,945	1,573,759
	1980	20,677	344,664	268,753	87,850	721,944	528,710	1,105,515
	1979	20,654	272,397	203,639	57,814	554,504	443,024	682,280
	1978	26,441	199,878	150,667	65,439	442,425	(†)	(†)
	1977	20,101	209,878	115,498	18,366	363,843	(†)	(†)

*1977-1978 based on completed costs reported to the U.S. FERC by fiscal year; 1979-1982 by calendar year. 1983-86 based on FERC construction permit applications, by fiscal year.
†One report only.

Top 10 interstate natural-gas pipeline companies—1985

Rank	Company	Mileage	Company	Sales, Mcf	Company	Net income, $1,000
1	Northern Natural Div. of Internorth	23,534	El Paso Natural Gas Co.	879,932	Texas Eastern Transmission Comp.	242,301
2	El Paso Natural Gas Co.	21,903	Natural Gas Pipeline Co. of America	868,628	El Paso Natural Gas Co.	213,326
3	Columbia Gas Transmission Corp.	18,780	Texas Eastern Transmission Corp.	791,334	ANR Pipeline Co.	207,708
4	Tenneco	14,102	Columbia Gas Transmission Corp.	650,178	Tenneco	179,386
5	Panhandle Eastern Pipe Line Co.	12,798	Northern Natural Div. of Internorth	575,433	Transcontinental Gas Pipe Line Corp.	146,082
6	Natural Gas Pipeline Co. of America	12,577	Transcontinental Gas Pipe Line Corp.	561,501	Southern Natural Gas Co.	127,345
7	KN Energy Inc.	12,138	Tenneco	553,093	Panhandle Eastern Pipe Line Co.	114,239
8	ANR Pipeline Co.	11,429	ANR Pipeline Co.	499,199	Natural Gas Pipeline Co. of America	105,386
9	Enserch Corp.*	10,726	Consolidated Gas Transmission Corp.	475,808	Colorado Interstate Gas Co.	72,019
10	Transcontinental Gas Pipeline Corp.	10,573	Texas Gas Transmission Corp.	429,458	Texas Gas Transmission Corp.	71,295
	Total	**148,560**		**6,284,564**		**$1,479,087**
	% of majors, 1985	**58.97**		**56.91**		**82.31**
	% of all companies, 1985	**53.17**		**50.14**		**67.53**

Source: U.S. FERC Form 2: Annual Report for Major Natural Gas Companies, Dec. 31, 1985. *Under FERC criteria, not a major company for 1985.

LIQUID PIPELINES

	Miles of pipeline				Deliveries, 1,000 bbl			Total trunkline traffic, million bbl-miles*			Fiscal data, $1,000			
		Trunk												
Company	**Gathering**	**Crude**	**Products**	**Total**	**Crude**	**Products**	**Total**	**Crude**	**Products**	**Total**	**Carrier property**	**Change**	**Operating revenue**	**Income**
Air Force Pipeline Co.	—	—	5	5	—	1,045	1,045	—	5	5	353	—	139	6
Algonquin Pipeline Co.	33	61	—	94	975	—	975	16	—	16	2,570	−340	802	146
Allegheny Pipeline Co.	—	—	603	603	—	13,971	13,971	—	5,010	5,010	27,850	66	7,752	2,358
Amerada Hess Pipeline Corp.	—	† 818	—	† 818	9,684	—	9,684	7,653	—	7,653	149,039	186	61,609	25,747
American Petrofina Pipeline Co.†	10	1,067	25	1,102	25,827	9,946	35,773	7,356	12	7,368	22,051	—	10,888	4,576
Amoco Pipeline Co.	2,256	7,900	2,087	12,243	343,650	136,743	480,393	122,242	8,934	131,176	533,137	3,233	215,904	93,641
ARCO Pipe Line Co.	1,636	†2,482	2,873	†6,991	442,480	152,848	595,328	160,584	14,777	175,361	2,385,884	−55,513	903,120	331,119
Asamera Pipeline, Inc.	—	—	—	—	1,311	—	1,311	1	—	1	2,403	2,403	270	−318
Ashland Pipe Line Co.	510	787	—	1,297	85,868	—	85,868	45,814	—	45,814	98,763	3,651	34,286	9,567
Atlantic Pipeline Corp.	—	14	938	952	10,658	10,713	21,371	—	1,648	1,648	43,925	43,927	7,226	1,000
Badger Pipe Line Co.	—	—	329	329	—	64,167	64,167	—	3,933	3,933	24,751	327	12,513	2,629
Belle Fourche Pipeline Co.	1,123	729	—	1,852	34,095	—	34,095	3,520	—	3,520	52,305	1,201	19,296	8,392
Black Lake Pipe Line Co.	—	255	—	255	3,606	—	3,606	665	—	655	10,054	3	1,263	75
BP Pipelines Inc.	—	†818	—	†818	108,896	—	108,896	86,797	—	86,797	1,608,074	1,897	528,119	186,366
Buccaneer Pipe Line Co.	—	—	—	—	136	—	136	—	—	—	200	—	20	−6

LIQUID PIPELINES—Continued

	Miles of pipeline				Deliveries, 1,000 bbl			Total trunkline traffic, million bbl-miles*			Fiscal data, $1,000			
		Trunk												
Company	Gathering	Crude	Products	Total	Crude	Products	Total	Crude	Products	Total	Carrier property	Change	Operating revenue	Income
Buckeye Pipe Line Co.	—	—	3,205	3,205	—	245,951	245,951	—	32,061	32,061	350,018	4,362	108,541	25,334
Buckeye Pipe Line Co., of Mich. Inc.	—	164	—	164	20,267	5,351	25,618	2,316	110	2,426	14,661	1,534	6,589	2,049
Butte Pipe Line Co.	—	373	—	373	36,076	—	36,076	9,772	—	9,772	18,453	354	11,757	3,173
Calnev Pipe Line Co.	22	65	583	670	—	24,389	24,389	—	4,778	4,778	38,592	7,079	16,177	7,559
Cenergy Transmission Co.	—	—	—	—	11	—	11	§	—	§	866	70	68	-147
Chase Transportation Co.	—	—	716	716	—	15,916	15,916	—	11,396	11,396	38,267	34	8,846	5,532
Chevron Pipe Line Co.	2,036	1,044	3,250	6,330	450,182	201,764	651,946	17,342	56,276	73,618	510,781	288,270	208,903	54,339
Chicap Pipe Line Co.	—	235	—	235	50,917	1,246	52,163	5,246	14	5,260	33,124	-40	5,275	678
Chisholm Pipeline Co.	—	—	203	203	–	13,767	13,767	—	2,792	2,792	19,278	46	5,261	3,194
Ciniza Pipe Line Inc.	233	135	11	379	9,267	1,153	10,420	397	13	410	6,526	—	3,182	606
Citgo Pipe Line Co.	248	372	1,010	1,630	49,682	68	49,750	5,783	§	5,783	45,868	1,429	24,561	5,248
Cities Service NGL Pipe Line Co.	—	—	106	106	—	1,897	1,897	—	201	201	3,210	—	796	252
CKB Petroleum Inc.	—	—	—	—	1,566	—	1,566	81	—	81	4,757	4,757	4,306	1,540
Clarco Pipeline Co.	90	—	—	90	2,594	—	2,594	§	—	§	3,364	14	737	156
CNG Pipeline Co.	—	—	—	—	1,906	—	1,906	§	—	§	4,174	-11	1,554	478
Cochin Pipeline System	—	—	1,200	1,200	—	20,282	20,282	—	20,472	20,472	240,150	154	53,920	33,529
Collins Pipeline Co.	—	—	124	124	—	29,697	29,697	—	3,682	3,682	15,384	—	3,682	993
Colonial Pipeline Co.	—	—	5,301	5,301	—	588,874	588,874	—	626,191	626,191	1,327,094	9,285	468,152	118,584
Continental Pipe Line Co.	4,047	1,522	1,923	7,492	199,673	49,096	248,769	13,825	9,039	22,864	178,026	5,943	77,401	36,690
Cook Inlet Pipe Line Co.	—	55	—	55	11,657	—	11,657	—	379	379	42,306	-197	13,177	2,284
Crown-Rancho Pipe Line Corp.	7	—	—	7	16,940	—	16,940	2,193	—	2,193	2,218	5	2,130	1,325
Diamond Shamrock Co.	—	—	622	622	—	16,613	16,613	—	9,323	9,323	32,376	-969	9,807	2,371
Dixie Pipeline Co.	—	—	1,303	1,303	—	32,081	32,081	—	16,652	16,652	74,140	1,079	40,950	10,166
Dome Pipeline Corp.	1	8	130	139	—	17,503	17,503	—	1,144	1,144	22,016	-37	2,889	9,145
El Paso Frontera Corp.	—	—	—	—	431	—	431	47	—	47	1,378	—	605	194
Emerald Pipe Line Corp.	—	—	113	113	—	2,607	2,607	—	221	221	1,430	—	719	176
Enterprise Pipeline Co.	—	—	98	98	—	4,427	4,427	—	434	434	20,189	—	3,380	1,987
Enterprise Products Co. of Mississippi	—	—	268	268	—	6,362	6,362	—	1,705	1,705	50,180	255	4,238	1,024
Eureka Pipe Line Co.	841	6	—	847	2,966	—	2,966	2	—	2	17,103	—	8,634	993
Explorer Pipeline Co.	—	—	1,397	1,397	—	155,327	155,327	—	107,667	107,667	253,748	1,169	82,690	18,396
Exxon Pipeline Co.	1,863	†5,787	2,480	†10,130	466,919	101,334	568,253	162,117	6,926	169,043	2,123,335	9,590	776,616	361,571
Farmland Industries Inc.	650	239	—	889	21,406	—	21,406	540	—	540	10,813	69	4,034	—
Four Corners Pipe Line Co.	283	1,207	24	1,514	101,114	21,206	122,320	17,042	43	17,085	156,190	11,739	59,201	9,803
Frontier Pipeline Co.	—	290	—	290	6,321	—	6,321	1,832	—	1,832	48,867	52	12,641	—
G & T Pipeline Co.	—	30	—	30	240	—	240	7	—	7	5,142	—	757	238
Getty Pipeline Inc.	—	199	368	567	34,918	18,313	53,231	1,420	798	2,218	45,025	5,015	8,757	6,353
Gulf Central Pipeline Co.	—	—	1,946	1,946	—	12,363	12,363	—	9,774	9,774	122,427	290	26,532	7,760
Hess Pipeline Co.	—	442	—	442	24,016	—	24,016	1	—	1	45,378	-25	12,990	3,160
Howell Crude Oil Co.	—	6	—	6	886	—	886	§	—	§	1,358	—	460	1,064
Husky Pipeline Co.	39	43	255	337	975	3,032	4,007	1	3	4	1,892	—	2,091	1,121
Hydrocarbon Transportation Inc.	—	—	1,513	1,513	—	34,389	34,389	—	19,002	19,002	132,932	601	43,675	9,686
Interstate Storage & Pipeline Corp.	—	—	23	23	—	1,791	1,791	—	41	41	5,100	278	1,238	415
Jayhawk Pipeline Corp.	241	513	—	754	38,007	—	38,007	3,789	—	3,789	22,677	2,461	8,512	1,480
Jet Lines Inc.	—	—	111	111	—	12,033	12,033	—	638	638	12,365	113	4,436	761
Kaneb Pipe Line Co.	—	—	2,080	2,080	—	48,450	48,450	—	12,115	12,115	103,615	1,421	33,294	7,273
Kaw Pipe Line Co.	1,389	—	—	1,389	19,077	—	19,077	§	—	§	12,245	153	6,914	1,631
Kerr-McGee Pipeline Corp.	8	56	—	64	1,335	—	1,335	31	—	31	5,081	636	2,125	1,030
Kiantone Pipeline Corp.§	—	78	—	78	16,238	—	16,238	1,270	—	1,270	9,689	—	3,410	744
Kuparak Pipeline Co.	—	37	—	37	80,139	—	80,139	2,633	—	2,633	126,282	142	49,480	35,120
Lake Charles Pipe Line Co.	—	—	13	13	—	72,218	72,218	—	340	340	10,782	58	3,649	948
Lakehead Pipe Line Co. Inc.	—	2,599	—	2,599	435,327	—	435,327	353,191	—	353,191	459,217	13,131	203,092	54,713
Largo Co., The	—	—	—	—	1,877	—	1,877	102	—	102	12,606	-183	2,473	534
Laurel Pipe Line Co.	—	—	453	453	—	29,438	29,438	—	4,700	4,700	57,084	218	12,577	1,699
Locap Inc.	—	59	—	59	140,463	—	140,463	8	—	8	120,388	11	14,120	-5,104
Marathon Pipe Line Co.	1,045	1,710	1,461	4,216	352,693	192,007	544,700	46	14	60	343,000	16,991	135,803	27,807
Mark Oil Pipeline Co.	—	—	—	—	460	—	460	§	—	§	955	-56	322	55
McMoran Pipeline Co.	—	—	—	—	312	—	312	20	—	20	1,919	—	647	188
Mesa Transmission Co.	—	11	—	11	813	—	813	30	—	30	10,065	558	3,451	1,450
Mid-America Pipeline Co. (MAPCO)	—	19	¶8,104	¶8,123	30,023	160,164	190,187	4,119	43,823	47,942	459,574	13,683	116,025	21,553
Mid-Valley Pipeline Co.	—	1,099	—	1,099	109,208	—	109,208	66,112	—	66,112	94,566	520	41,714	9,877
Milne Point Pipe Line Co.	11	—	—	11	695	—	695	§	—	§	26,673	26,673	1,327	973
Minden Pipeline Co.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Minnesota Pipe Line Co.	—	510	—	510	67,344	—	67,344	17,240	—	17,240	66,870	34,479	22,872	5,800
Mitco Pipeline Co.	9	—	—	9	139	—	139	§	—	§	2,105	—	84	-101
Mobil Alaska Pipeline Co.	—	†818	—	†818	26,301	—	26,301	20,892	—	20,892	397,034	458	107,939	49,817

LIQUID PIPELINES—Continued

Company	Miles of pipeline				Deliveries, 1,000 bbl			Total trunkline traffic, million bbl-miles*			Fiscal data, $1,000			
		Trunk												
	Gathering	Crude	Products	Total	Crude	Products	Total	Crude	Products	Total	Carrier property	Change	Operating revenue	Income
Mobil Eugene Island Pipeline Co.	—	66	—	66	12,568	—	12,568	1,099	—	1,099	30,738	935	10,288	3,673
Mobil Pipe Line Co.	4,316	5,210	1,743	11,269	206,119	98,620	304,739	67,715	11,084	78,799	303,550	6,386	168,837	53,510
National Transit Co.	226	—	—	226	722	—	722	§	—	§	3,648	—	1,740	175
Navajo Pipeline Co.	—	110	323	433	—	5,276	5,276	—	1,159	1,159	8,512	129	5,536	1,822
Northern Rockies Pipe Line Co.	—	—	—	—	1,019	—	1,019	—	—	—	1,049	—	336	576
NW Pipeline Inc.	—	—	—	—	2,136	—	2,136	186	—	186	5,747	9	1,957	1,769
Ohio Oil Gathering Corp. II	750	—	—	750	5,386	—	5,386	—	—	—	10,397	77	10,108	493
Ohio River Pipe Line Co.	—	—	400	400	—	15,030	15,030	—	1,704	1,704	22,532	334	6,157	1,403
Oiltanking of Texas Pipeline Co.	—	19	—	19	9,187	—	9,187	92	—	92	11,291	—	749	-472
Okie Pipe Line Co.	541	—	405	946	9,624	4,801	14,425	—	722	722	22,644	5,654	7,212	1,289
Olympic Pipe Line Co.	—	—	391	391	—	80,512	80,512	—	14,885	14,885	57,785	247	24,737	6,097
Osage Pipe Line Co.	—	136	—	136	23,101	—	23,101	3,142	—	3,142	19,565	-25	4,611	819
Owensboro-Ashland Co.	—	296	—	296	60,890	—	60,890	15,894	—	15,894	45,091	1,484	10,039	1,699
Paloma Pipeline Co.	—	—	—	—	21,476	—	21,476	1,287	—	1,287	5,749	-49	2,097	614
Pennzoil Offshore Pipeline Co.	—	4	—	4	1,102	—	1,102	53	—	53	3,365	554	1,316	439
Phillips Alaska Pipeline Corp.	—	†818	—	†818	8,524	—	8,524	6,793	—	6,793	126,315	167	36,632	13,215
Phillips Pipe Line Co.	1,077	807	4,050	5,934	74,334	204,492	278,826	13,086	45,799	58,885	326,000	14,715	141,975	40,516
Pioneer Pipe Line Co.	—	—	301	301	—	12,037	12,037	—	2,693	2,693	12,788	82	5,747	1,388
Plantation Pipe Line Co.	—	—	3,158	3,158	—	181,899	181,899	—	116,035	116,035	292,374	4,294	112,907	27,045
Platte Pipe Line Co.	—	1,281	—	1,281	74,992	—	74,992	48,312	—	48,312	78,595	3,543	43,853	13,858
Pogo Offshore Pipeline Co.	—	—	—	—	3,469	—	3,469	360	—	360	9,375	—	2,404	916
Portal Pipe Line Co.	306	615	—	921	29,184	—	29,184	11,177	—	11,177	43,396	1,350	21,503	7,720
Portland Pipe Line Co.	—	343	—	343	21,268	—	21,268	3,531	—	3,531	50,499	333	14,394	3,071
Pure Transportation Co.	827	738	16	1,581	96,975	20,380	117,355	18,845	246	19,091	91,701	8,142	35,717	10,736
Santa Fe Pipeline Co.	—	—	922	922	—	33,002	33,002	—	16,312	16,312	55,159	2,694	19,482	7,045
Seminole Pipeline Co.	—	774	—	774	—	42,136	42,136	—	21,209	21,209	205,238	1,177	28,526	7,978
Shamrock Pipe Line Corp., The	640	318	567	1,525	31,741	19,885	51,626	1,665	3,305	4,970	33,104	3,417	14,494	2,705
Shell Pipe Line Corp.	2,041	4,703	417	7,161	385,829	113,063	498,892	99,867	3,574	103,441	449,281	16,378	146,443	42,597
Sohio Pipe Line Co.	1,075	699	167	1,941	420,361	104,911	525,272	219,848	10,051	229,899	3,374,308	40,081	1,083,894	336,217
Sonat Oil Transmission Inc.	—	42	—	42	1,311	—	1,311	14	—	14	5,553	347	962	515
Southcap Pipe Line Co.	—	—	—	—	37,812	[illegible]	37,812	22,613	—	22,613	53,790	201	9,796	785
Southern Pacific Pipelines Inc.	—	—	2,784	2,784	—	271,5[illegible]	271,508	—	34,559	34,559	239,066	53,606	108,569	43,200
Sun Oil Line Co. of Michigan	—	—	—	—	—	[illegible]	—	—	—	—	668	—	117	43
Sun Pipe Line Co.	307	493	1,731	2,531	62,463	116,051	178,514	2,646	12,882	15,528	119,615	-4,289	67,430	25,267
Tecumseh Pipe Line Co.	—	204	—	204	13,703	—	13,703	2,039	—	2,039	15,280	-9	2,021	367
Texaco-Cities Service Pipe Line Co.	—	34	—	34	8,021	—	8,021	274	—	274	36,300	256	1,285	-1,855
Texas Eastern Transmission Corp.	—	—	3,389	3,389	—	140,048	140,048	—	77,973	77,973	424,489	4,664	119,944	—
Texas Pipe Line Co.	1,245	2,489	497	4,231	267,231	118,096	385,327	51,380	6,625	58,005	286,008	14,138	98,396	27,643
Texas-New Mexico Pipe Line Co.	1,782	2,215	—	3,997	154,015	—	154,015	26,206	—	26,206	89,543	787	44,613	12,543
Tomahawk Pipe Line Co.	—	239	—	239	3,180	—	3,180	155	—	155	1,833	54	608	-16
Total Pipeline Corp.	193	583	97	873	59,636	16,024	75,660	10,245	1,376	11,621	42,124	2,717	9,217	-653
Trans Mountain Pipe Line Corp.	—	64	—	64	7,439	—	7,439	375	—	375	6,747	44	2,362	925
Trans-Ohio Pipeline Co.	—	—	133	133	—	9,124	9,124	—	399	399	13,843	—	2,570	974
Transco Terminal Co.	—	—	—	—	324	—	324	§	—	§	3,122	3	727	190
Union Alaska Pipe Line Co.	—	†818	—	†818	8,718	—	8,718	7,007	—	7,007	125,984	172	40,881	12,951
Wascana Pipeline Co.	—	58	—	58	—	—	—	—	—	—	2,077	—	—	-149
Wesco Pipe Line Co.	532	760	—	1,292	75,442	—	75,442	8,724	—	8,724	81,175	4,031	22,093	1,341
West Emerald Pipe Line Corp.	—	—	296	296	—	2,152	2,152	—	487	487	1,931	100	1,173	152
West Shore Pipe Line Co.	—	—	321	321	—	63,625	63,625	—	7,726	7,726	34,293	668	16,744	4,229
West Texas Gulf Pipe Line Co.	—	581	—	581	117,667	—	117,667	47,768	—	47,768	45,977	642	28,567	10,540
Western Oil Transportation Co. Inc.	443	—	—	443	9,079	—	9,079	•	•	•	31,083	213	4,133	28,868
White Shoal Pipeline Corp.	7	—	—	7	5,233	—	5,233	232	—	232	2,622	5	533	129
Williams Pipeline Co.	82	—	9,128	9,210	4,243	182,986	187,229	2,639	51,246	53,885	572,283	24,262	149,730	27,568
Wolverine Pipe Line Co.	—	—	620	620	—	78,644	78,644	—	9,913	9,913	71,566	97	23,540	5,509
Wood River Pipeline Co.	—	573	—	573	4,640	—	4,640	2,659	—	2,659	159,145	129	7,392	379
Wyco Pipe Line Co.	—	—	677	677	—	19,979	19,979	—	3,506	3,506	26,439	476	14,992	4,736
Yellowstone Pipe Line Co.	—	—	749	749	—	21,169	21,169	—	7,235	7,235	28,600	91	13,369	3,686
1985 Totals	**35,021**	**55,844**	**80,536**	**171,401**	**6,238,731**	**4,505,992**	**10,744,723**	**1,842,013**	**1,499,791**	**3,341,804**	**21,605,239**	**680,285**	**7,460,847**	**2,430,845**
1984 Totals	**36,072**	**56,975**	**80,875**	**173,922**	**✓5,671,448**	**✓4,552,237**	**✓10,223,685**	**✓1,854,886**	**1,551,457**	**✓3,406,343**	**19,397,450**	**322,294**	**7,823,582**	**2,544,764**

Source: U.S. FERC Form 6: Annual Report of Oil Pipeline Companies, Dec. 31, 1985. *Some barrel-mile data are provided by the American Petroleum Institute, Policy Analysis Dept. †Mileage represents Trans-Alaska pipeline and is included in total only once to avoid duplication. §Fewer than 1 million bbl-miles. ¶Includes 1,095 miles of ammonia pipeline. •No barrel-mile data reported under FERC exemption. ✓Revised from initial OGJ publication.

GAS PIPELINES

Company	Miles of pipeline				Total compressor stations			Total sales, MMcf	Fiscal data, $1,000			
	Transmission	Field	Storage	Total	Transmission	Other	Total		Gas plant	Additions	Operating revenues	Net income
Alabama-Tennessee Natural Gas Co.	—	—	—	—	—	—	—	28,403	20,473	165	116,519	4,190
Algonquin Gas Transmission Co.*	938	—	—	938	4	—	4	167,849	251,570	38,304	701,318	20,184
Algonquin LNG Inc.	—	—	—	—	—	—	—	—	21,791	3	4,374	605
American Distribution Co. (new)	—	—	—	—	—	—	—	—	7,651	3,016	15,310	651
ANR Pipeline Co.*	7,723	3,511	195	11,429	37	71	108	499,119	2,435,693	88,896	2,392,705	207,708
ANR Storage Co.	—	—	—	—	—	—	—	—	121,395	770	36,066	8,288
Arkansas Oklahoma Gas Corp.	370	186	—	556	†7	—	†7	11,707	47,633	5,315	42,304	1,990
Arkla Energy Resources, Div. of Arkla*§	5,920	3,744	—	9,664	†327	—	†327	230,861	1,238,027	59,155	945,789	69,490
Associated Natural Gas Co.	584	—	—	584	—	—	—	9,376	39,396	1,916	47,989	967
Bayou Interstate Pipeline System	—	—	—	—	—	—	—	1,096	42	—	2,495	216
Bear Creek Storage Co.	—	—	25	25	—	1	1	—	144,830	392	49,065	23,025
Black Marlin Pipeline Co.	65	—	—	65	—	—	—	26,046	20,950	4,874	2,100	213
Blue Dolphin Pipeline Co.	49	—	—	49	—	—	—	—	1,120	1,120	—	−69
Bluefield Gas Co.	—	—	—	—	—	—	—	873	2,174	34	5,213	−51
Boundary Gas Inc. (new)	—	—	—	—	—	—	—	13,494	—	—	46,756	—
Canyon Creek Compression Co.	1	—	—	1	1	—	1	—	22,242	349	8,696	928
Capital Oil Co. Inc.	—	—	—	—	—	—	—	259	1,514	67	1,062	−22
Caprock Pipeline Co.	39	14	—	53	2	2	4	466	5,108	—	1,206	98
Carnegie Natural Gas Co.	258	922	—	1,180	7	6	13	16,310	88,776	5,838	72,852	4,597
Chandeleur Pipe Line Co.	174	—	—	174	—	—	—	—	20,742	9,226	1,103	−577
Cimarron Transmission Co.	—	41	—	41	—	—	—	2,772	1,529	111	5,125	51
Colorado Interstate Gas Co.*	2,739	3,161	234	6,134	28	37	65	203,236	702,769	24,047	756,191	72,019
Columbia Gas Transmission Corp.*	10,643	6,890	1,247	18,780	113	49	162	650,178	2,132,297	42,662	3,149,727	−254,162
Columbia Gulf Transmission Co.*	4,243	—	—	4,243	13	26	39	—	1,041,307	15,431	225,669	22,372
Columbia LNG Corp.	—	—	—	—	—	—	—	—	202,091	37	13,646	1,747
Commercial Pipeline Co. Inc.	75	—	—	75	—	—	—	251	902	37	1,085	45
Consolidated Gas Transmission Corp.*	3,551	4,129	526	8,206	42	26	68	475,808	1,103,975	51,130	2,102,997	69,599
Consolidated System LNG Co.	112	—	—	112	—	—	—	—	267,390	−8	18,153	−1,326
Distrigas of Mass. Corp.	—	—	—	—	—	—	—	—	48,546	3,216	124,449	734
East Tennessee Natural Gas Co.*	1,023	—	—	1,023	11	1	12	65,515	88,884	4,342	269,414	5,058
Eastern Shore Nat. Gas Co.	—	—	—	—	—	—	—	8,242	11,854	1,959	37,230	2,198
El Paso Natural Gas Co.*	9,345	12,540	18	21,903	52	53	105	879,932	3,175,982	125,976	3,953,062	213,326
Enserch Corp. (1984 major)	8,304	2,330	92	10,726	26	30	56	298,267	968,848	65,298	1,410,776	−38,507
Equitable Gas Co.	527	1,489	—	2,016	†20	—	†20	54,127	523,252	39,265	332,405	54,361
Florida Gas Trans. Co.*	4,366	—	—	4,366	20	—	20	201,081	488,590	15,301	745,700	37,300
Gas Gathering Corp.	—	31	—	31	—	—	—	529	1,520	17	1,978	−398
Gas Transport Inc.	—	108	—	108				2,231	3,848	63	10,920	−941
Gasdel Pipeline System Inc.	125	—	—	125	—	—	—	—	13,070	955	4,033	567
Glacier Gas Co.	34	3	—	37	1	—	1	285	2,334	—	139	—
Granite State Gas Trans. Inc.	57	—	—	57	1	—	1	32,582	3,226	87	134,276	168
Great Lakes Gas Trans. Co.*	1,321	—	—	1,321	14	—	14	36,210	529,265	8,690	286,595	25,243
Great Plains Natural Gas Co.	65	—	—	65	—	—	—	4,533	14,355	2,385	22,069	799
Hampshire Gas Co.	—	18	—	18	—	1	1	100	8,739	231	2,609	598
High Island Offshore System*	203	—	—	203	1	—	1	—	356,060	3,240	67,464	5,909
Honeoye Storage Corp.	11	18	—	29	—	3	3	—	8,748	24	2,099	274

GAS PIPELINES—Continued

	Miles of pipeline				Total compressor stations			Total sales, MMcf	Fiscal data, $1,000			
Company	Transmission	Field	Storage	Total	Transmission	Other	Total		Gas plant	Additions	Operating revenues	Net income
Indiana Utilities Inc.	21	—	—	21	—	—	—	338	1,655	109	1,812	86
Inland Gas Co. Inc.	128	395	—	523	—	5	5	6,772	22,895	19	29,358	-108
Inter-City Minnesota Pipelines Ltd.	66	—	—	66	—	—	—	9,641	3,269	465	22,594	-17
Interstate Power Co.	—	—	—	—	—	—	—	48,958	35,090	1,926	300,612	24,022
Iowa Public Service Co.	—	—	—	—	—	—	—	36,286	86,301	6,333	384,391	31,398
Iowa-Illinois Gas and Electric Co.	—	—	—	—	—	—	—	63,396	173,370	4,680	562,151	59,266
Jupiter Energy Corp.	—	—	—	—	—	—	—	10,500	2,392	—	108	144
K N Energy Inc.*	9,299	2,818	21	12,138	27	69	96	74,331	348,014	19,318	300,182	33,607
Kentucky West Va. Gas Co.	76	2,072	—	2,148	7	5	12	16,435	65,492	5,034	88,697	25,735
Lawrenceburg Gas Trans. Corp.	6	—	—	6	—	—	—	2,732	455	12	10,551	-50
Locust Ridge Gas Co.	—	88	—	88	—	1	1	1,759	2,757	22	5,319	-76
Lone Star Gathering Co.	80	7	—	87	—	—	—	—	2,761	—	382	56
Louisiana-Nevada Transit Co.	78	—	—	78	—	—	—	4,185	2,336	176	8,119	442
Marengo Corp.	—	—	—	—	—	—	—	581	48	—	2,628	106
Michigan Consolidated Gas Co.*	2,276	58	112	2,446	72	8	80	316,877	1,372,374	60,212	1,847,251	51,729
Michigan Gas Storage Co.*	562	—	—	562	1	1	2	56,402	53,479	416	230,914	2,486
Michigan Power Co.	—	—	—	—	—	—	—	20,719	50,250	2,662	147,752	4,187
Mid-Louisiana Gas Co.	410	450	—	860	—	—	—	24,195	82,618	5,587	86,512	10,443
Midwestern Gas Transmission Co.*	903	—	10	913	15	1	16	170,942	165,442	3,857	628,757	-10,608
MIGC Inc.	164	27	—	191	5	4	9	9,304	11,391	424	41,167	1,370
Miss. River Transmission Corp.*	1,968	169	74	2,211	15	6	21	153,534	397,506	24,648	619,187	24,238
Mountain Fuel Resources Inc.*	1,518	789	50	2,357	14	29	43	75,643	345,189	30,515	359,108	19,548
National Fuel Gas Distribution Corp.	771	337	—	1,108	—	2	2	145,401	571,156	41,881	873,526	20,671
National Fuel Gas Supply Corp.*	1,435	1,523	442	3,400	19	5	24	156,370	245,033	19,424	708,260	23,452
Natural Gas Pipeline Co. of America*	10,552	1,920	105	12,577	76	40	116	868,628	2,358,234	161,797	3,115,611	105,386
Northern Natural Division of Internorth Inc.*	14,817	8,509	208	23,534	149	3	152	575,433	2,595,542	85,862	2,554,110	-14,055
North Penn Gas Co.	571	283	—	854	1	—	1	15,146	40,109	2,385	72,913	1,013
Northern Border Pipeline Co.*	824	—	—	824	2	—	2	—	1,294,482	-1,675	242,945	58,728
Northwest Alaskan Pipeline Co.*	—	—	—	—	—	—	—	208,125	—	—	637,961	-1,128
Northwest Central Pipeline Corp.*	5,845	3,756	176	9,777	27	56	83	279,010	607,771	26,284	869,829	46,991
Northwest Pipeline Corp.*	3,504	3,464	7	6,975	29	21	50	261,085	1,335,753	103,728	1,196,834	48,641
O'Fallon Gas Service Co.	—	—	—	—	—	—	—	257	249	27	1,962	185
Ohio River Pipeline Corp.	25	—	—	25	—	—	—	6,676	3,661	10	26,309	16
Orange & Rockland Utilities Inc.	—	—	—	—	—	—	—	22,937	111,165	8,367	476,046	39,757
Overthrust Pipeline Co.*	89	—	—	89	—	—	—	—	62,994	330	13,027	2,510
Ozark Gas Transmission System	—	—	—	—	—	—	—	—	145,317	2,039	29,964	2,093
Pacific Gas Transmission Co.*	799	42	—	841	12	2	14	298,096	397,672	14,362	1,043,676	27,598
Pacific Interstate Offshore Co.	—	—	—	—	—	—	—	29,879	12,014	3	99,908	1,188
Pacific Interstate Trans. Co.	—	—	—	—	—	—	—	78,422	58,544	359	378,889	3,315
Pacific Offshore Pipeline Co.	—	—	—	—	—	—	—	7,445	143,791	4,861	69,385	11,782
Panhandle Eastern Pipeline Co.*	6,780	5,913	105	12,798	68	71	139	334,929	1,495,439	28,807	1,653,610	114,239
Panmark Gas Co.	—	—	—	—	—	—	—	60,336	—	—	171,851	307
Pelican Interstate Gas System	—	—	—	—	—	—	—	—	11,103	—	1,745	-56
Penn-York Energy Corp.	—	—	33	33	—	2	2	—	49,599	693	26,679	6,780
Pennsylvania & Southern Gas. Co.	—	—	—	—	—	—	—	5,517	16,383	977	30,665	881
Phillips Gas Pipeline Co.	153	—	—	153	—	—	—	15,393	48,282	1,203	55,225	4,119
Raton Natural Gas Co.	21	—	—	21	—	—	—	1,259	257	—	4,816	44
Ringwood Gathering Co.	43	273	—	316	—	2	2	7,753	10,158	353	12,721	340

GAS PIPELINES—Continued

Company	Miles of pipeline: Transmission	Field	Storage	Total	Total compressor stations: Transmission	Other	Total	Total sales, MMcf	Fiscal data, $1,000: Gas plant	Additions	Operating revenues	Net income
Sabine Pipe Line Co.	172	—	—	172	—	—	—	—	37,634	12,823	7,635	2,313
Seagull Interstate Corp. (new)	6	5	—	11	—	—	—	—	6,118	6,118	223	-161
Sea Robin Pipeline Co.*	420	—	—	420	3	2	5	119,321	251,895	14,295	337,768	11,022
Shenandoah Gas Co.	164	—	—	164	—	—	—	3,896	13,915	1,187	22,156	975
South County Gas Co.	—	—	—	—	—	—	—	392	2,946	219	2,969	-139
South Georgia Natural Gas Co.	767	—	—	767	2	—	2	24,638	23,082	943	110,008	5,598
South Penn Gas Co.	6	—	—	6	—	—	—	475	575	2	2,207	30
Southern Energy Co. (LNG)	—	—	—	—	—	—	—	—	155,364	656	642	-7,364
Southern Natural Gas Co.*	7,625	140	48	7,813	49	12	61	406,441	1,241,796	73,496	1,824,976	127,345
Southwest Gas Corp.	1,252	8	—	1,260	5	—	5	103,583	67,952	14	611,017	23,620
Southwest Gas Storage Co.	—	—	31	31	—	1	1	—	68,884	437	20,908	4,226
Southwest Gas Trans. Co. (new)	8	—	—	8	—	—	—	—	1,524	1,748	178	82
Standard Pacific Gas Lines Inc.* (new major)	184	—	—	184	—	—	—	—	24,618	798	1,485	-380
Stingray Pipeline Co.*	353	—	—	353	2	—	2	—	246,176	7,085	40,117	6,878
Superior Offshore Pipeline Co.	112	—	—	112	—	—	—	—	8,803	1,478	731	381
Tarpon Transmission Co.	40	—	—	40	—	—	—	—	21,046	1	1,688	307
TCP Gathering Co.	—	20	—	20	—	—	—	—	1,167	—	222	25
Tenneco, Inc.* (new major)	14,069	31	2	14,102	63	1	64	553,093	3,440,122	205,986	2,685,391	179,386
Texas Eastern Transmission Corp.*	9,658	48	201	9,907	66	14	80	791,334	2,522,344	151,888	2,757,205	242,301
Texas Gas Pipe Line Corp.	6	—	—	6	—	—	—	1,874	325	—	4,057	33
Texas Gas Trans. Corp.*	5,749	48	218	6,015	29	8	37	429,458	907,717	48,516	1,592,098	71,295
Texas Sea Rim Pipeline Inc.	29	—	—	29	—	—	—	—	15,226	—	1,151	-1,608
Trailblazer Pipeline Co.* (new major)	436	—	—	436	—	—	—	—	26[illegible],380	-658	52,152	8,196
Transcontinental Gas Pipe Line Corp.*	10,308	144	121	10,573	37	6	43	561,501	3,141,798	263,160	2,713,853	146,082
Transco Gas Supply Co.*	—	—	—	—	—	—	—	108,386	10	—	354,270	3,055
Transwestern Pipeline Co.*	3,813	626	—	4,439	21	—	21	218,747	682,473	20,654	847,222	37,148
Trunkline Gas Co.*	4,020	497	27	4,544	21	13	34	210,767	993,853	35,982	1,006,535	17,276
Trunkline LNG Co.	—	—	—	—	—	—	—	—	579,580	485	60,413	1,633
U-T Offshore System*	30	—	—	30	—	—	—	—	63,191	225	10,707	-316
Union Gas Systems Inc.	413	16	9	438	2	5	7	11,544	30,421	5,364	44,755	-69
Union Light, Heat & Power Co.	—	—	—	—	—	—	—	10,055	59,949	3,269	180,497	4,750
United Cities Gas Co.	224	—	—	224	—	—	—	24,420	103,920	8,392	132,146	1,965
United Gas Pipe Line Co.*	7,288	2,238	28	9,554	35	14	49	365,326	1,114,888	31,158	1,531,649	-81,544
Valero Interstate Trans. Co.	—	—	—	—	—	—	—	13,625	12,770	425	56,261	-565
Valley Gas Transmissions Inc.		274	—	274	—	—	—	6,425	4,965	4	17,177	-413
Washington Gas Light Co.	357	—	—	357	—	—	—	104,066	738,277	39,355	728,211	41,786
Washington Natural Gas Co. (new)	—	—	—	—	—	—	—	—	17,579	3	—	—
West Texas Gas Inc.	—	—	—	—	—	—	—	765	18,705	197	27,111	3,202
West Texas Gathering Co.	—	—	—	—	—	—	—	15,293	11,174	6,900	23,227	-1,939
Western Gas Interstate Co.	191	50	—	241	†5	—	†5	3,193	8,997	348	12,269	-176
Western Trans. Corp.	—	61	—	61	—	—	—	678	4,316	127	3,037	495
Williston Basin Interstate Pipeline Co.* (new)	3,082	879	158	4,119	22	9	31	40,155	197,958	5,246	177,005	-2,259
Wyoming Interstate Co. Ltd.*	269	—	—	269	1	—	1	—	176,717	-242	32,022	4,044
Zenith Natural Gas Co.	27	32	—	59	—	2	2	457	630	66	818	35
1985 Totals—majors (44)	**180,490**	**67,587**	**4,333**	**252,410**	**1,537**	**654**	**2,191**	**11,043,723**	**41,894,279**	**1,912,648**	**47,582,348**	**1,796,937**
1984 Totals—majors (43)	**183,363**	**64,944**	**4,499**	**252,806**	**1,059**	**881**	**1,940**	**12,846,108**	**37,752,086**	**1,921,032**	**52,331,468**	**2,881,827**
1985 Totals—all	**197,727**	**77,145**	**4,523**	**279,395**	**1,629**	**726**	**2,355**	**12,533,273**	**48,321,080**	**2,240,578**	**56,252,921**	**2,190,817**
1984 Totals—all	**187,465**	**66,172**	**4,742**	**258,379**	**1,152**	**898**	**2,050**	**14,171,864**	**47,309,644**	**2,433,582**	**64,006,035**	**4,055,700**

Source: FERC Forms 2's & 2A's for major and nonmajor natural-gas pipeline companies. Under criteria established for the 1984 reporting year (OGJ, Nov. 25, 1985, p. 80), major pipeline companies are those whose combined gas sold for resale and gas transported or stored for a fee exceeded 50 bcf at 14.73 psi (60° F.) in each of the 3 previous calendar years. Nonmajors are natural-gas pipeline companies not classified as majors and having had total gas sales of volume transactions exceeding 200 MMcf at 14.73 psi (60° F.) in each of the 3 previous calendar years. * Major natural-gas pipeline companies under FERC Accounting and Reporting Requirements for Natural Gas Companies, para. 20-011, effective Feb. 2, 1985, beginning with 1984 reporting year. † Type of compressor station not indicated by reporting company. § Contesting its classification by the FERC as a major, Arkla has filed Form 2A for 1984 and 1985.

• Offshore (e) Estimated (c) Condensate (NA) Not available

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
ABU DHABI	**DEPARTMENT OF PETROLEUM**	• Arzanah, 1973	11,000-11,300	409	59	346	997,031	7,872,358,000	42.0
		• Abu Al Bukhoosh, 1969	8,900-10,900						32.0
		• Mubarras, 1969	8,300-10,000						37.0
		• El Bunduq, 1964	9,400-10,900						40.0
		Asab, 1965	8,000- 8,700						41.0
		Bab, 1958	8,600- 9,300						44.0
		Bu-Hasa, 1962	8,300- 9,200						39.0
		Sahil, 1967	9,500- 9,800						41.0
		• Umm Shaif, 1958	9,800-12,000						37.0
		• Zakum, 1963	9,600-12,000						39.0
		• Umm al-Dalkh, 1969	7,700-8,500						...
		Total Abu Dhabi		**409**	**59**	**346**	**997,031**	**7,872,358,000**	
ALGERIA(e)	**SONATRACH**	Zarzaitine, 1957	4,700	NA	NA	NA	584,000	7,179,087,000	42.2
		Edjeleh, 1956	1,500- 2,800						37.2
		Tiguentourine, 1966	2,160- 4,265						44.4
		El Adeb Lareche, 1958	4,100						43.3
		Assakaifaf N. & S., 1958	2,800						42.7
		Tan Emellel N. & S., 1960	2,800- 4,500						42.5
		Edeyen, 1964	5,580						41.5
		Hassi Mazoula S., 1963	4,430						40.2
		Hassi Mazoula B., 1965	4,920						42.0
		Acheb W. & Kreb, 1963 & 1960	7,360						45.6
		Tin Fouye N. +F6, 1962	4,265						39.6
		El Borma, 1967	8,200						42.9
		Keskassa, 1968	8,860						42.9
		Mereksen, 1974	9,420						45.8
		Gara, 1962	9,420						42.9
		Hassi Messaoud N., 1956	10,500						45.9
		Hassi Messaoud S., 1956	10,500						46.1
		Gassi-Touil & Gassi-Touil E., 1961	6,890						50.6-50.8
		Hassi Chergui	8,200						50.6
		Nezla N., 1965	8,530						51.5
		Rhourde El Baguel, 1962	9,850						40.2
		Mesdar E. & W., 1972	11,155						40.3
		El Gassi-El Agreb, 1959	10,170						47.9
		Rhourde Nouss & E., 1972	8,530						39.7
		Tin Foye Tabankort, 1966	4,600- 6,560						41.1-41.3
		Djoua W., 1967	5,580- 6,240						41.1
		Amassak, 1970	6,565						41.1
		Tamendjelt, 1970	5,585- 6,890						41.1
		Timedratine, 1964	8,155						42.7
		Ohanet N. & S., 1960	7,878						43.8
		Askarene, 1962	8,200						41.7
		Guelta, 1962	8,960						41.7
		Stah, 1971	9,515						45.8
		Ras Toumb, 1976	9,190						35.7
		Haoud Berkaoui-Ben Kahla, 1965	11,000						43.6
		Guellala-Guellala N.E., 1969	11,320						42.2-42.3
		N'Goussa, 1974	11,715						42.2
		Kef El Argoub, 1973	12,570						42.2
		Oued Noumer, 1969	8,860						48.3
		Djorf, 1974	9,025						48.3
		Djebel Onk, 1960	3,940						37.0
		Alrar FJT	...						...
		Hassi R'Mel(c)	...						...
		Gassi Touil(c)	...						...
		Other Crude	...						...
		Condensate	...						...
		Total Algeria		**NA**	**NA**	**NA**	**584,000**	**7,179,087,000**	
ANGOLA	**FINA ANGOLA**	Benfica, 1955	8,300	...	1	14	20	2,266,047	30.0
		Luanda, 1957	5,650	...	...	12	...	890,882	...
		Cacuaco, 1958	7,870	...	2	10	14	240,683	30.0
		Galinda, 1959	7,220	...	...	8	...	2,245,301	30.0
		Tobias, 1961	1,970	1	...	11	60	28,792,169	31.0
		Mulenvos, 1966	5,900- 6,600	1	6	9	240	4,925,955	25.0
		Quenguela, 1968	6,000	...	26	32	2,500	36,005,576	31.0
		Legua, 1972	6,300	..	1	...	100	611,921	31.0
		Bento, 1972	7,350	1	...	4	300	4,755,644	26.0

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
	C. Cobra, 1969	4,000	7	...	4	400	2,450,788	41.0
	Quinguila, 1972	3,400	3	12	2	7,500	28,584,426	36.0
	N'Zombo, 1973	5,000- 6,300	9	15	5	13,000	81,097,134	33.0
	Quinfuquena, 1975	6,800- 7,100	1	12	2	5,100	21,657,936	32.0
	Ganda, 1975	5,000	3	...	...	2,500	4,282,701	36.0
	Seriea, 1974	6,200	2	...	...	200	813,354	27.0
	Lumueno, 1977	4,600	8	...	1	2,300	2,240,200	37.0
	Pambo, 1982	4,600	4	...	...	850	1,276,323	39.0
	Luango, 1977	3,800	1	2	...	800	1,561,630	38.0
CHEVRON	• Malongo North, 1966	1,170- 8,150	4	57	9	14,500	202,951,639	30.0
	• Malongo West, 1967	1,680- 8,800	4	19	16	16,900	220,606,894	26.0
	• Malongo South, 1966	1,150- 1,440	2	26	5	8,200	67,494,846	25.0
	• Kali, 1969	11,400-11,660	1	...	...	390	4,041,287	31.0
	• Kungulo, 1975	3,860- 4,300	7	10	...	13,150	37,165,228	30.0
	• Limba, 1969	2,660- 7,350	2	9	3	12,400	79,246,794	31.0
	• Kambala, 1971	10,730-11,050	2	3	...	7,800	13,865,954	33.0
	• Livuite, 1979	7,270- 8,200	4	1	2	880	2,209,140	41.0
	• Takula, 1982	3,120- 9,030	55	11	5	107,350	91,316,872	30.0
	• Lifuma, 1984	7,850- 8,030	1	...	...	820	148,330	32.0
	• Vuko, 1983	3,020- 3,950	6	...	...	10,500	1,982,260	...
TEXACO	• Cuntala, 1978	7,000- 7,500	...	1	...	340	2,152,306	31.0
	• Essungo, 1975	6,500- 6,700	5	5	...	6,400	16,575,893	35.0
ELF ANGOLA	• Palanca, 1981	8,860	8	...	...	37,700	15,897,908	40.0
	• Pacassa, 1982	11,500	2	...	...	12,600	739,487	38.0
	Total Angola		**144**	**219**	**154**	**285,814**	**981,043,511**	
ARGENTINA **YPF**	Chubut, 1907	1,908- 9,168	27	2,231	43	87,969	951,963,215	21.1-26.0
	Jujuy, 1969	2,461-16,732	10	...	...	1,541	60,366,263	46.5-47.0
	La Pampa, 1968	3,609- 4,921	2	187	2	8,296	70,376,376	31.0
	Mendoza, 1932	2,178-16,778	34	1,120	10	99,039	1,021,474,774	23.7-32.0
	Neuquen, 1918	1,312-12,498	185	830	37	63,508	449,455,123	24.0-41.0
	Rio Negro, 1960	2,953- 7,546	59	798	18	42,003	417,851,243	22.5-41.0
	Salta, 1928	6,551-15,092	33	12	13	13,699	114,010,744	39.0-59.0
	Santa Cruz, 1946	1,468-17,060	128	2,919	64	98,410	933,137,877	21.1-30.0
	Tierra del Fuego, 1959	5,249- 7,824	95	101	11	20,530	143,180,329	43.4-46.0
	Formosa, 1984	11,466-11,490	3	...	2	4,019	2,914,799	42.0-42.9
	Total Argentina		**576**	**8,198**	**200**	**439,014**	**4,164,730,743**	
AUSTRALIA **BARRACK ENERGY**	Mount Horner, 1965	3,800- 5,800	...	1	3	2	7,280	38.0
BHP PETROLEUM PTY. LTD	• Jabiru, 1983	4,786	1	...	...	...	...	42.3
	Riverslea, 1981	4,504	...	2	1	160	228,560	25.2
	Yapunyah, 1982	4,311	...	1	...	4	16,860	39.2
BOND CORP., PETROLEUM DIVISION	Harriet, 1983	6,230	5	...	...	7,[illegible]23	1,275,144	38.2
BRIDGE OIL LTD.	Thomby Creek, 1979	5,180	...	...	4	...	52,833	50.0
	Yellow Bank Creek, 1982	5,064	1	2	1	156	298,722	52.0
	Louise, 1986	5,900	1	1	...	2	543	59.0
CSR OIL & GAS DIV. BRISBANE	Anabranch, 1965	4,188	1	...	...	13	11,442	44.0
	Duarran, 1964	4,105	1	...	...	40	14,036	37.0
	Maffra, 1965	4,251	2	...	...	15	20,832	48.0
	Richmond, 1963	3,643	1	...	...	7	14,877	43.0
	Snake Creek, 1964	4,990	1	...	...	25	10,219	67.0
	Sunny Bank, 1962	6,139	1	...	...	3	706	40.0
	Trinidad, 1965	4,599	2	...	...	30	62,341	46.0
DELHI PETROLEUM	Jackson, 1981	4,750	5	27	...	14,500	11,281,000	40.0-48.0
	Jackson South, 1982	4,800	...	6	...	1,700	1,255,000	40.8
	Chookoo	6,000	2	...	...	300	75,000	45.0
	Wilson	5,000	...	6	...	400	261,000	40.0
	Naccowlah South, 1983	6,000	...	6	..	2,500	1,470,000	40.0-46.0
	Gunna	6,000	...	1	...	60	48,000	40.0
	Tinpilla	6,000	...	1	...	45	47,000	40.0
	Naccowlah West, 1983	5,700	...	7	...	1,500	865,000	40.0
	Bogala	6,900	...	1	...	220	159,000	40.0
	Yanda	8,000	...	1	...	70	20,000	40.0
	Mooliampah	6,000	1	...	...	110	34,000	40.0
	Watson South	5,500	1	...	...	600	176,000	40.0
	Sigma	5,700	...	1	...	150	24,000	40.0
	Tickalara	5,600	1	...	...	150	52,000	40.0
	Big Lake	6,600	2	2	...	360	161,000	45.0-48.0
	Gidgealpa, 1984	6,150	7	4	...	2,300	1,009,000	45.0-50.0
	McKinlay	5,100	...	1	...	50	13,000	41.0
	Strzelecki, 1978	5,800	11	8	...	7,000	2,037,000	43.0-49.0
	Dullingari, 1979	5,200	2	14	...	4,200	4,548,000	54.0
	Narcoonowie	6,000	2	...	...	110	60,000	52.0-53.0
	Limestone Creek/Biala, 1984	5,100	1	3	...	1,100	393,000	41.0
	Wancoocha, 1984	6,000	5	...	...	1,200	581,000	44.0-54.0
	Muteroo	6,000	2	1	...	2,500	665,000	45.0
	Spencer	6,500	2	...	...	700	95,000	47.0
	Jena	5,200	...	1	...	80	21,000	41.0

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
				Flow	Artificial lift	Shut-in			
		Alwyn	5,200	...	1	...	140	24,000	41.0
		Dirkala	7,000	1	...	...	700	79,000	54.0
		Nungaroo	4,150	...	1	...	90	3,000	42.0
		Ulandi	5,200	...	1	...	90	32,000	40.0
	ESSO-BHP	• Barracouta, 1965	4,550	...	2	...	3,806	31,161,900	62.8
		• Marlin, 1966	5,100	...	1	3	9,359	48,863,300	50.0
		• Kingfish, 1967	7,500	4	22	11	43,276	912,236,000	46.9
		• Halibut, 1967	7,700	10	...	7	74,219	652,553,000	43.3
		• Mackerel, 1969	7,700	6	12	...	96,986	299,659,000	45.6
		• Tuna, 1968	6,500	20	...	2	5,118	29,010,600	40.5
		• Snapper, 1968	4,350	2	14	5	5,407	8,942,700	47.0
		• Cobia, 1972	7,700	10	...	2	22,528	39,136,900	44.6
		• West Kingfish, 1968	7,500	15	...	3	22,338	36,150,200	46.9
		• Fortescue, 1978	7,700	23	...	2	94,711	91,646,800	43.0
		• Flounder, 1968	8,200	8	...	2	6,318	5,222,540	46.7
	HARTOGEN GROUP	Kooroopa, 1985	3,300	...	1	...	30	8,738	42.0
		Talgeberry, 1985	3,900	...	3	...	166	57,013	46.0
		Washpool, 1985	5,250	...	...	1	...	...	...
		Toobunyah, 1985	3,500	1	3	...	254	49,233	43.0
		Takyah, 1985	3,800	...	2	...	18	3,264	43.0
		Ipundu, 1986	2,700	...	1	...	43	7,800	43.0
		Borah Creek, 1982	4,900	...	...	2	...	8,265	34.0
		Kincora, 1980	4,700	1	3	...	64	276,299	34.0
		Sandy Creek, 1982	4,900	1	...	...	5	6,496	34.0
		Waratah, 1982	5,350	...	4	...	149	216,801	34.0
		Tintaburra, 1984	3,500	1	5	...	423	198,399	43.0
	HOME ENERGY	Blina, 1981	4,300	...	6	...	814	757,000	37.0
		Sundown, 1983	3,600	...	2	2	153	115,000	39.0
		West Terrace, 1985	3,800	...	1	...	98	54,000	33.0
	LASMO	Bodalla South, 1984	4,800-5,230	6	...	...	2,946	1,397,609	47.2-48.7
		Kenmore, 1985	4,600-4,980	6	...	...	2,441	553,690	48.2-45.8
		Black Stump, 1986	5,360	1	...	...	255	37,500	45.2
		Glenvale, 1985	3,800	...	...	1	16	3,369	49.3
	MOONIE OIL N.L.	Moonie, 1961	5,800	...	21	8	674	21,321,862	44.5
		Alton, 1964	6,000	...	5	2	29	1,875,333	49.5
		Bennett, 1965	5,960	...	1	...	5	113,021	45.0
		Cabawin, 1961	10,800	1	...	...	11	56,050	49.0
		Mereenie, 1964	4,000	22	...	...	3,682	1,688,301	48.9
	PANCONTINENTAL PETROLEUM LTD.	Nockatunga, 1983	5,420	...	4	1	13	109,861	49.6
		Winna, 1985	4,526	...	1	...	141	32,943	46.3
		Koora, 1985	4,822	...	1	1	1	928	41.7
		Thungo, 1986	4,670	...	1	...	96	3,537	45.7
	SANTOS LTD.	Tirrawarra, 1970	9,500	29	...	...	3,867	5,146,862	52.0
		Moorari, 1971	7,705-9,400	5	1	...	534	838,644	46.9
		Fly Lake, 1971	9,300	3	...	...	268	406,030	53.0
		Brolga, 1983	9,547	1	...	...	77	17,788	53.0
		Woolkinna, 1982	9,700	1	...	...	104	74,093	51.5
		Merrimelia, 1964	5,250-7,070	9	2	...	1,704	1,812,400	35.5
		Meranji, 1985	5,660	...	2	...	446	121,800	41.0
		Bookabourdie, 1984	7,000	...	1	...	48	11,700	46.0
	STRATA OIL	Woodada,[c] 1980	7,400	2	...	4	7	24,651	54.0
	WAPET GROUP	Barrow Island, 1964	1,200-6,700	7	387	110	20,273	214,720,463	37.0
		Dongara, 1969	5,250-5,577	3	2	3	154	859,634	35.5
	WOODSIDE	North Rankin,[c] 1972	9,800	7	...	...	7,192	3,546,774	52.3
		Total Australia		**267**	**612**	**181**	**482,472**	**2,438,818,486**	
AUSTRIA	**MOBIL**	Voitsdorf, 1963	7,000	3	19	15	565	21,311,716	36.0
		Sattledt, 1971	5,700	...	13	1	661	4,754,776	37.0
		Kemating, 1979	6,100	...	8	1	976	3,160,083	34.0
		Gaiselberg, 1938	5,200	1	36	31	709	31,683,344	26.0
		Other	...	4	71	36	2,254	25,109,347	34.0
	OEMV[e]	Hochleiten, 1977	3,100-5,000	7	35	...	15,938	562,754,305	21.3
		Matzen, 1949	6,100	81	864	...			25.7
		Pirawarth, 1957	1,600-6,500	...	73	...			28.4
		St. Ulrich, 1938	1,600-4,300	1	185	...			31.1
		Other	...	6	202	...			...
		Total Austria		**103**	**1,506**	**84**	**21,103**	**648,773,571**	
BAHRAIN	**BANOCO**	Awali, 1932	1,850-4,600	156	124	34	42,300	765,000,000	33.0
		Total Bahrain		**156**	**124**	**34**	**42,300**	**765,000,000**	
BARBADOS	**BARB. NOC**	Woodbourne, 1966	1,665-6,701	25	70	47	1,845	3,868,707	29.0
		Total Barbados		**25**	**70**	**47**	**1,845**	**3,868,707**	
BENIN	**PAN OCEAN**	Seme, 1968	6,232	...	6	...	7,500	8,137,500	22.6
		Total Benin		**...**	**6**	**...**	**7,500**	**8,137,500**	

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
BOLIVIA **YPFB$^{(e)}$**	Camiri, 1927	3,936	13	70	...	13,907	267,448,900	55.0
	Carand, 1960	3,940	27	14	...			60.0
	Colpa, 1961	9,184	17	...	...			65.0
	Monteagudo, 1966	4,592	14	25	...			41.0
	La Pena, 1965	8,856	24	...	...			43.0
	Palmar, 1964	10,758	7	...	...			65.0
	Rio Grande, 1961	9,512	40	...	...			62.0
	Vuelta Grande, 1978	8,220	4	...	...			67.0
	Espino, 1979	14,655	2	...	...			56.2
	Other	...	15	50	...			...
OCCIDENTAL	Tita, 1976	6,450	10	...	5	190	4,224,838	67.9
	Porvenir,* 1978	9,600	7	...	2	3,850	8,677,052	60.5
TESORO BOLIVIA PETROLEUM CO.	La Vertiente, 1977	15,230	7	...	...	1,334	3,452,052	64.1
	Escondido, 1980	11,293	...	...	3	...	...	60.0
	Taiguati, 1981	10,174	...	...	1	...	...	63.0
	Los Suris, 1981	13,577	...	...	1	...	...	50.0
*Cycling project	**Total Bolivia**		**187**	**159**	**12**	**19,281**	**283,802,842**	
BRAZIL*$^{(e)}$ **ALAGOAS**	Furado, 1969	4,440- 5,500	11	33	...	577,000	1,923,988,000	35.0
	Pilar	NA	17	9	...			40.0
	Tabuleiro de Martins, 1957	NA	...	24	...			27.0
	Other	...	5	6	...			...
BAHIA	Agua Grande, 1951	820- 4,265	24	102	...			40.0
	Aracas, 1965	3,280- 8,856	9	114	...			41.0
	Buracica, 1959	1,476- 1,840	...	197	...			35.0
	Faz. Imbe, 1964	2,130- 5,575	1	32	...			40.0
	Faz. Boa Esperanca, 1966	7,215- 8,036	...	12	...			39.0
	Faz. Panelas, 1962	NA	...	13	...			37.0
	Malombe, 1966	3,280	...	20	...			41.0
	Mata/Remanso, 1971	4,445- 4,560	13	46	...			35.0
	Miranga, 1965	3,280- 3,936	7	157	...			40.0
	Rio Dos Ovos, 1979	NA	...	11	...			35.0
	Santana, 1962	NA	...	...	...			37.0
	Sesmaria	NA	7	16	...			NA
	Candeias, 1941	3,280- 7,415	2	29	...			30.0
	Cassarongongo, 1959	1,475- 4,755	...	18	...			32.0
	Dom Joao Terra, 1947	NA	...	53	...			38.0
	Riacho da Barra, 1982	NA	5	27	...			39.0
	Taquipe, 1958	3,115- 3,935	4	57	...			40.0
	• Candeias Mar	NA	1	13	...			30.0
	• Dom Joao Mar, 1947	920	3	280	...			38.0
	• Ilheus, 1979	NA	...	...	...			41.0
	Cexis, 1983	...	9	...	...			30.0
	Faz. Balsamo, 1983	2,500- 4,000	8	4	...			31.0
	Rio Pojuca, 1982	5,600- 6,200	9	6	...			35.0
	Other	...	8	121	...			...
CEARA	Faz. Belem, 1980	1,150- 2,500	...	95	...			13.0
	• Curima, 1978	6,888	10	...	...			32.0
	• Xareu, 1977	5,717- 5,766	20	2	...			39.0
	• Atum, 1983	...	7	...	...			25.0
	• Espada, 1983	...	5	...	...			26.0
ESPIRITO SANTO	Faz. Cedro, 1962	5,248	...	10	...			28.0
	Sao Mateus, 1969	NA	...	44	...			27.0
	Lagoa Parda, 1977	5,576	11	30	...			30.0
	Rio Itaunas, 1977	NA	3	30	...			28.0
	• Cacao, 1978	9,184	3	1	...			32.0
	Lagoa Suruaca, 1982	...	12	2	...			30.0
	Laqoa Piabanha, 1984	...	3	...	...			27.0
	Other	...	1	36	...			...
RIO DE JANEIRO	• Enchova, 1976	6,973- 7,885	10	...	...			23.0
	• Bonito, 1977	NA	10	...	...			27.0
	• Garoupa, 1974	11,382	...	14	...			30.0
	• Namorado, 1975	10,083	9	...	...			28.0
	• Garoupinha, 1974	12,693	3	...	...			30.0
	• Pampo, 1977	6,215	7	...	...			21.0
	• Area RJS-236, Trilha, 1983	NA	4	...	...			28.0
	• Linguado, 1981	NA	9	...	...			20.0
	• Badejo, 1981	NA	3	2	...			28.0
	• Bicudo, 1982	NA	5	...	...			22.0
	• Corvina, 1983	8,800- 9,000	4	...	...			27.0
	• Pirauna, 1982	8,900- 9,300	7	...	...			28.0
	• Sul de Pampo, 1978	9,300- 9,600	4	...	...			20.0
	• Cherne, 1982	9,900-10,200	9	...	...			27.0
	• Bagre, 1983	8,700- 9,000	1	...	...			25.0
	• Parati, 1982	8,900- 9,200	3	...	...			25.0
	• Viola, 1981	9,200- 9,900	4	...	...			26.0
	• Marimba, 1983	8,900- 9,200	1	...	...			28.0
	• Anequim	8,200- 8,500	3	...	...			27.0
RIO GRANDE DO NORTE	Alto do Rodrigues	990- 1,120	...	164	...			18.0
	• Ubarana, 1973	7,216- 8,365	35	21	...			40.0

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
		• Agulha, 1975	5,412	2	...	...			33.0
		Estreito/Rio Panon	650- 820	...	135	...			16.0
		Faz. Pocinho	1,450- 2,000	13	47	...			35.0
		Palmeiras	1,450- 1,800	...	27	...			25.0
		Serraria	3,200- 3,900	2	8	...			27.0
		Guamaré	1,400- 1,600	...	8	...			25.0
		Other	...	...	46	...			...
	PARÁ	• Área 1-PAS-11, 1983	...	...	...	...			41.0
	MARANHÃO	São João, 1983	4,950- 6,200	...	2	...			40.0
	SERGIPE	Atalaia Sul	NA	...	...	...			NA
		Carmopolis, 1963	2,460	...	581	...			24.0
		Riachuelo, 1961	1,475	...	187	...			28.0
		Siririzinho, 1967	1,640	...	138	...			30.0
		• Caioba, 1969	6,232- 6,890	9	...	...			36.0
		• Camurim, 1970	6,232	10	12	...			25.0
		• Dourado, 1970	3,620- 3,635	4	...	...			36.0
		• Guaricema, 1968	3,335- 4,430	7	6	...			41.0
		• Robalo, 1973	...	3	...	...			30.0
		Other	...	1	66	...			...
*Total output by Petrobras, grouped by states.		**Total Brazil**		**400**	**3,114**	...	**577,000**	**1,923,988,000**	
BRUNEI	SHELL	• Fairley, 1969	10,740	43		7	15,863	100,271,000	40.0
		• Ampa SW, 1963	7,068- 8,155	82		125	37.086	492,913,000	41.0
		• Magpie, 1975	NA	18		3	19,565	57,041,000	21.0
		• Champion, 1970	4,300	190		60	45,722	263,376,000	23.0
		Seria, 1928	NA	375		166	27,001	960,787,000	34.0
		Rasau, 1929	NA	2		2	2,391	1,433,000	30.0
		Other	...	...		5	...	12,998,000	...
		Total Brunei		**710**		**368**	**147,628**	**1,888,819,000**	
BURMA(e)	MYANMA	Chauk-Lanywa, 1902	1,500- 4,000	170	275	...	30,000	477,230,000	36.0
		Mann, 1970	1,600- 7,000						37.5
		Myanaung, 1964	2,000- 4,000						40.5
		Prome, 1965	850- 5,000						36 0
		Yenangyaung, 1902	100- 6,700						36.0
		Total Burma		**170**	**275**	...	**30,000**	**477,230,000**	
CAMEROON	ELF(e)	• Betika, 1972	5,300	138	28	4	172,430	276,627,000	42.5
		Ekoundou S., 1975	6,200						24.0
		Kole, 1974	5,500						31.0
		Kombo Center, 1976	5,900						37.0
		Kombo North, 1978	7,200						35.0
		Ekoundou Horst plus Center, 1972	7,200						29.0
		Boa, 1976	5,900						35.0
		Bavo South, 1976	5,600						29.3
		Betika S. Marine, 1979	6,300						30.0
		Ekuondou N. Marine, 1977	5,250						36.0
		Mokoko NE plus Abana, 1977	4,600						29.0
		Asoma Marine, 1973	3,600						19.0
		Kita E. Marine, 1978	6,900						40.8
		Mokoko S. Marine, 1977	3,300						17.0
		Inova Marine, 1976	6,200						32.8
	TOTAL-CFP	• Moudi, 1979	5,250- 5,900	5	2	3	5,600	6,870,000	40.0
		• Moudi D., 1980	3,300	...	...	...	1,970	1,430,000	21.3
		Total Cameroon		**143**	**30**	**7**	**180,000**	**284,927,000**	

		Name of field, discovery date	Depth, feet	No. of wells capable of prod.	B/d average, first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
CANADA	ALBERTA	Acheson, 1950	3,390	118	9,752	113,579,278	38.0
		Bantry, 1940	2,574- 3,300	181	6,033	42,941,527	...
		Bellshill Lake, 1955	2,950	406	14,576	51,398,578	...
		Bonnie Glen, 1952	3,959- 6,779	164	34,814	482,102,763	34.0-44.0
		Carson Creek N., 1958	8.787- 8,935	73	8,493	131,699,012	44.0
		Cessford, 1950	2,800- 3,028	249	3,022	27,833,541	...
		Clive, 1951	6,074- 6,208	166	5,669	46,089,384	...
		Countess, 1951	2,858- 4,272	150	7,484	57,558,782	...
		Fenn-Big Valley, 1950	3,900- 5,400	330	30,026	300,625,090	32.0
		Gilby, 1962	4,201- 7,000	152	3,631	44,699,780	...
		Golden Spike, 1949	3,570- 5,961	82	1,584	179,704,569	36.0
		Harmattan-Elkton, 1955	8,796-10,757	73	5,032	57,778,258	...
		Innisfail, 1956	6,730- 8,440	77	4,620	70,609,634	...
		Joarcam, 1949	3,179	277	5,420	97,357,599	...
		Joffre, 1953	4,983- 6,779	164	3,039	79,967,340	...
		Judy Creek, 1951	8,307- 8,701	273	19,712	377,804,260	43.0
		Kaybob, 1957	4,870- 9,577	87	5,941	96,699,188	...

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
	Kaybob S., 1958	5,600-10,042		101		11,814	70,787,899	...
	Leduc-Woodbend, 1947	3,062- 5,380		738		5,306	372,558,152	40.0
	Lloydminster, 1933	1,690- 1,945		837		6,179	43,735,536	...
	Medicine River, 1954	5,435- 7,600		331		9,724	61,670,014	...
	Mitsue, 1964	5,908		330		21,986	257,297,011	43.0
	Nipisi, 1965	5,648- 5,726		311		31,756	246,037,348	41.0
	Pembina, 1953	3,000- 6,133		3,925		91,055	1,153,739,123	32.0-37.0
	Provost, 1946	2,760- 2,898		1,159		11,260	56,214,675	...
	Rainbow, 1965	4,994- 6,160		297		44,116	471,882,726	38.0-42.0
	Rainbow S., 1965	6,102- 6,400		66		5,994	58,025,392	...
	Red Earth, 1956	4,184- 4,878		253		5,423	33,148,896	...
	Redwater, 1948	2,012- 3,200		848		16,603	775,570,801	35.0
	Simonette, 1958	10,500		37		1,971	36,037,877	...
	Snipe Lake, 1962	8,500		94		3,286	50,555,201	...
	Sturgeon Lake S., 1953	4,912- 8,471		143		14,763	128,606,828	37.0
	Sundre, 1954	8,700- 9,000		62		3,076	34,083,343	...
	Swan Hills, 1957	8,100		802		44,603	644,254,075	40.0
	Swan Hills S., 1959	8,400		200		21,228	328,232,257	...
	Turner Valley, 1913	3,100- 9,150		160		2,757	137,452,608	39.0
	Utikuma Lake, 1963	5,624		133		11,651	39,609,918	...
	Virginia Hills, 1957	9,210		177		10,799	133,217,639	34.0
	Wainwright, 1925	1,903- 2,200		748		9,801	60,390,126	...
	Westerose, 1952	6,818		31		12,270	117,561,009	...
	Willisden Green, 1956	5,157		774		10,084	108,707,098	...
	Wizard Lake, 1951	4,044- 5,973		45		20,256	309,849,758	...
	Zama	3,702		235		6,340	70,702,001	33.0-37.0
	Other	...		13,150		391,218	1,451,219,187	...
BRITISH COLUMBIA	Boundary Lake, 1957	3,418- 4,575		365		11,125	161,615,222	40.0
	Other	...		786		23,815	239,304,984	...
MANITOBA	All fields	...		1,590		14,091	153,735,586	...
SASKATCHEWAN	Steelman, 1950	4,600		690		8,314	246,897,370	...
	Weyburn, 1955	4,600		730		8,242	271,409,112	...
	Other	...		15,580		179,821	1,548,101,158	...
ONTARIO	All fields	...		1,100		2,517	59,826,273	...
NEW BRUNSWICK	All fields	...		50		31	816,859	...
NORTHWEST TERRITORIES	All fields	...		137		25,171	38,739,645	...
	Total Canada			**50,037**		**1,267,296**	**12,243,344,038**	

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
CHILE **ENAP-MAINLAND**	Canadon, 1962	6,090	11	1	51	242	14,336,508	38.4
	Daniel, 1960	5,806	9	2	112	141	34,351,311	25.4
	Daniel Este, 1961	5,523	6	1	60	463	28,072,431	25.0
	Dungeness, 1962	5,251	2	2	15	60	3,864,958	28.6
	Posesion, 1960	5,622	39	...	37	850	20,727,569	63.6
	Other	...	8	14	92	2,517	20,963,803	...
TIERRA DEL FUEGO	Calafate, 1955	6,045	7	7	47	1,347	24,987,609	49.3
	Catalina Sur, 1961	5,779	...	2	41	6	6,351,185	44.0
	Cullen, 1954	5,730	12	6	87	499	40,779,505	41.8
	Tres Lago, 1957	5,724	21	...	63	452	15,614,170	40.1
	Catalina, 1956	5,756	3	14	9	4,130	4,944,080	38.7
	Other	...	17	19	205	1,569	56,933,374	...
STRAIT OF MAGELLAN	Ostion, 1977	7,156	...	14	4	1,950	6,890,280	33.0
	Posesion, 1977	6,727	8	10	17	921	4,560,536	34.5
	Spiteful, 1977	6,298	6	46	30	7,049	37,935,465	34.5
	Spiteful Norte, 1978	7,150	1	10	47	1,316	8,723,057	39.0
	Daniel Este-Dungeness, 1977	6,126	22	2	3	2,868	1,816,516	35.9
	Pejerrey, 1984	7,229	3	28	12	9,014	3,941,484	39.0
	Total Chile		**175**	**178**	**932**	**35,394**	**335,793,841**	
CHINA, TAIWAN **CHINESE PETROLEUM**	Tiechengshan, 1959	...	29	...	4	1,162	14,538,225	51.0
	Chingtsohu, 1967	...	9	...	9	122		50.0
	Yunghoshan, 1971	...	25	...	5	378	5,991,267	45.0
	Chuhuangkeng	...	21	...	1	188		50.0
	Total China, Taiwan		**84**	...	**19**	**1,850**	**20,529,492**	
COLOMBIA **ECOPETROL**	Galán, 1945	3,200	...	52	19	1,144	20,914,000	19.0
	Infantas, 1918	3,200	...	260	48	2,548	222,817,000	25.8
	La Cira, 1925	3,250	...	612	84	8,451	458,347,000	24.0
	Lis-Nutria, 1957	9,500	23	95	8	6,831	31,313,000	31.0
	Llanito, 1960	7,300	...	54	7	5,531	19,395,000	21.0
	Cantagallo, 1941	6,800	...	9	2	703	17,923,000	19.7
	Casabe, 1941	3,800	...	262	93	7,205	218,953,000	20.7
	Yarigui, 1954	8,700	...	53	5	7,832	106,970,000	19.5
	Boquete, 1961	8,000	...	...	21	56	16,995,000	43.0
	Cicuco, 1956	...	...	...	...	284	43,233,000	...
	Petrolea, 1933	...	...	6	15	120	36,836,000	...
	Tibú, 1940	...	...	189	72	4,715	224,204,000	...

	WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
		Ortega, 1951	...	...	6	...	394	11,254,000	...
		Apiay, 1981	10,500	6	...	...	5,526	6,935,000	23.0
		Orito, 1963	6,600	...	45	24	10,606	184,081,000	39.7
		Other	...	2	127	86	504	102,585,000	...
	INTERCOL	Bonanza, 1963	4,000	...	15	...	929	12,246,000	30.0
		Provincia, 1962	8,000	...	65	...	15,916	147,881,000	33.0
		Arauca, 1980	18,000	...	4	...	819	3,657,000	41.0
		Other	...	...	...	...	...	667,000	...
	HOCOL	Dina, 1961	3,600- 6,500	2	62	...	24,911	63,566,000	20.1-22.5
		Tello, 1971	7,000	...	...	...	9,742	34,509,000	22.0
		San. Fco., 1985	3,000	...	27	...	9,393	3,022,000	26.0
		Palogrande, 1971	6,000	...	37	...	...	10,312,361	20.0
		Other	...	5	48	...	200	10,998,000	...
	ELF AQUITAINE	Trinidad, 1974	9,600	1	1	...	1,498	1,631,000	33.0
		Barquerena, 1982	10,300	1	1	...	1,677	1,207,000	37.0
		Caño Gar. Nrt., 1980	11,000	3	...	...	672	906,000	...
		Other	...	8	1	...	662	1,949,000	...
	ARGOSY	Bourdine, 1974	11,000	...	3	...	921	2,667,000	24.1
		Máxime, 1976	11,000	...	1	...	...	111,000	26.3
		Nancy, 1974	11,000	...	1	...	314	1,710,000	25.5
	SHELL	Sta. Rosa, 1984	...	...	...	...	27	52,492,000	...
	OCCIDENTAL	Payoa, 1962	8,000	...	39	...	1,196	68,722,000	27.0
		Salina, 1936	2,500	...	71	...	2,468	10,786,000	28.0
		Caño Limón, 1984	7,600	...	2	...	20,698	2,183,000	29.0
		La Yuca, 1984	...	...	3	...	83,039	7,932,000	...
		Matanegra, 1984	...	...	3	...	27,124	2,213,000	...
		Other	...	...	...	...	...	5,277,000	...
	TEXACO	Cocorná, 1963	2,100	...	55	...	3,245	11,690,000	12.0-13.0
		Palagua, 1956	5,000	...	126	...	4,615	78,207,000	14.0-17.0
		Tisquirama, 1963	8,000	...	8	...	823	4,531,000	16.0-28.0
		Velasquez, 1946	7,500	...	141	...	4,831	162,390,000	19.0-24.0
		Teca, 1981	2,100	...	138	...	15,544	11,997,000	12.0-13.0
		Other	...	...	13	...	250	4,422,000	...
	CHEVRON	Rio Zulia, 1961	5,700	...	24	...	1,980	129,320,000	41.0
		Castilla, 1969	6,500	...	15	...	9,929	14,334,000	13.5
		Chichimene, 1974	...	...	...	...	499	79,000	...
	PETROCOL	Andalucia, 1980	1,700	...	22	...	1,964	3,392,000	33.0
		Total Colombia		**51**	**2,696**	**464**	**308,336**	**2,589,761,361**	
CONGO	**AGIP-ELF**	• Loango, 1972	3,000	4	45	3	28,175	67,859,056	26.8
	ELF CONGO[e]	• Emeraude, 1969	820	...	113	...	86,825	273,255,436	21.8
		• Likouala, 1979	4,270	28	...	...			33.1
		• Yanga, 1979	2,950	47	...	...			29.4
		• Sendji, 1973	3,940	41	...	...			30.1
		Pointe Indienne, 1951	5,000	...	3	...			36.9
		Mengo, 1979	6,500	...	3	...			34.0
		Kundsi, 1980	4,000	...	2	...			35.8
		Total Congo		**120**	**166**	**3**	**115,000**	**341,114,492**	
DENMARK	**DUC**	• Dan, 1971	6,000- 6,400	...	...	...	8,350	29,417,423	30.7
		• Gorm, 1971	6,500- 7,000	...	...	...	30,880	52,401,699	34.7
		• Skjold, 1977	5,000	...	...	...	15,820	14,996,373	29.6
		• Rolf, 1981	...	...	...	...	10,170	1,835,208	37.7
		• Tyra,[c] 1986	...	...	...	...	9,200	4,308,184	56.6
		Total Denmark		...	...	...	**74,420**	**102,958,887**	
DUBAI	**DUPETCO**[e]	• Fateh, 1966	7,900- 9,000	102	39	15	330,600	1,712,684,000	31.8
		• S.W. Fateh, 1970	7,500- 9,000						30.3
		• Falah, 1972	8,100						25.5
		• Rashid, 1973	9,400-11,500						38.0
	ARCO	Margham, 1981	11,200	8	...	...	19,400	13,663,000	43.5
		Total Dubai		**110**	**39**	**15**	**350,000**	**1,726,347,900**	
ECUADOR	**TEXACO**	Lago Agrio, 1967	10,175	22		...	9,900	[e]1,181,908,000	28.5
		Sacha, 1969	10,160	89		...	62,854		28.0
		Shushufindi, 1959	9,772	46		...	108,542		30.0
		Aguarico, 1968	9,850	5		...	6,600		27.2
		Auca, 1970	10,578	23		...	17,923		28.0
		Auca Sur-1, 1980	10,578	1		...	1,043		28.0
		Atacapi, 1968	9,855	4		...	2,177		31.0
		Parahuacu, 1968	10,173	2		...	965		30.0
		Yuca, 1970	10,423	6		...	3,943		28.0
		Yuca Sur-1, 1979	10,423	1		...	347		28.0

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
	Yulebra, 1980	10,345	2		...	2,030		21.4
	Culebra, 1973	10,626	1		...	855		17.5
	Cononaco, 1972	11,233	11		...	20,917		33.3
	Dureno	10,290	1		...	781		31.0
	Guanta	...	1		...	897		...
CEPE-ORIENTE	Shushuqui, 1980	9,200	6		...	6,553		28.8
	Shuara, 1980	9,100	8		...	7,999		29.6
	Secoya, 1980	9,100	15		...	18,678		30.3
	Charapa, 1967	10,000	12		...	332		30.0
	Cuyabeno, 1972	8,050	4		...	6,239		28.8
	Sansahuari, 1979	8,100	1		...	2,379		28.8
	Tetete, 1980	9,300	5		...	4,708		28.0
	Bermejo, 1967	5,000	9		...	6,360		34.0
ASSOCIACION CEPE-CITY	Mariann, 1971	7,700	5		...	1,067		20.0
	Fanny 18-B, 1972	7,700	8		...	3,686		22.5
	Tarapoa, 1973	8,300	1		...	296		20.0
CEPE-PENINSULA	Ancon, 1921	4,000	475		...	851		35.6
	Carpet	...	70		...	144		...
	Cautivo	...	100		...	138		...
	Total Ecuador		**934**		...	**299,204**	**1,181,908,000**	

EGYPT

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
GUPCO/AMOCO	• El Morgan, 1965	5,100- 6,400	1	72	33	116,307	945,400,372	27.0-32.0
	• July, 1973	8,100-10,000	3	26	8	66,003	409,127,466	31.0-34.6
	• Ramadan, 1974	11,300	1	17	6	52,434	338,538,092	31.7
	• October, 1978	11,000	17	1	9	117,965	230,883,569	28.0
	• Shoab Ali, 1978	5,500	...	21	19	16,802	68,455,391	30.0
	• SG-300, 1976	5,876	...	1	1	6,227	16,124,782	24.8
	• Sidki (382), 1977	10,500	6	...	1	8,012	34,443,430	33.9
	• GS (365) 1980	10,140	...	...	1	...	514,872	32.0
	• GS (277), 1980	8,610	1	...	...	2,235	1,758,837	34.0
	• SB (305), 1981	8,100	...	1	...	631	1,696,208	30.0
	• Badri (315), 1981	6,400	1	11	19	12,817	23,708,857	27.0
	• Younis (347), 1981	4,300	...	2	3	2,606	8,397,924	32.0
	• GH (376), 1981	8,600	...	5	...	2,216	4,146,315	25.0
	• SB (339), 1981	4,600	...	1	...	271	290,712	29.5
	• Nessim (336), 1981	6,700	...	2	1	2,075	8,097,807	26.9
	• Hilal (404), 1982	9,200-10,000	6	...	...	27,491	21,002,335	32.0
	• Waly (356), 1982	6,900	1	...	2	337	2,464,290	35.0
	• GS (345/346), 1982	7,500	1	...	1	681	989,078	38.0
	• SB (367), 1984	7,000	1	...	...	2,800	872,211	38.0
	• GS (381), 1985	8,700	1	...	...	4,040	817,481	37.0
	Abu Gharadig, 1972	9,500	11	1	8	7,934	31,756,936	36.0
	WD-33, 1972	9,800-10,800	...	1	1	60	2,090,660	32.0
	Razzak, 1972; and E. Razzak	7,000	1	11	3	3,173	48,949,579	36.0
PETROBEL/AGIP	Belayim, 1954	7,000- 8,500	1	33	21	43,744	403,839,300	22.5
	• Belayim, 1961	8,500	1	93	16	119,949	487,921,000	29.5
WEPCO/PHILLIPS PETROLEUM	El Alamein, 1966	8,700	4	8	3	2,148	65,166,412	33.6
	Umbaraka, 1976	10,700	5	...	...	2,338	4,278,334	43.9
	Yidma, 1971	9,000	2	...	3	1,366	21,179,616	44.0
GPC	Gharib, 1938	2,200- 4,500	...	81	134	4,315	245,677,430	24.3
	Bakr, 1958/W. Bakr, 1978	3,200- 1,500	1	47	35	3,264	74,893,676	18.0-19.0
	Umel Yusr, 1968	3,000- 3,300	2	17	18	2,436	32,617,728	21.5
	Amer, 1965	3,500	1	20	18	3,232	11,117,964	21.5
	El Ayoun, 1968	3,300	...	5	7	319	6,046,612	22.0
	Kareem, 1958	2,300	...	6	29	292	10,822,240	16.6
	Kheir, 1973	1,050	...	1	3	70	1,006,720	28.5
	Shukheir, 1966	2,500	5	...	6	1,415	2,881,736	34.0
	Ras El Behar	4,500	6	...	5	8,565	9,754,150	32.5
	Esh Elmalaha	3,700	2	...	...	226	62,900	44.0
	Sudr, 1946	- 2,600	1	11	8	1,252	48,819,628	21.6
	Asl, 1947	3,000	3	...	3	877	41,049,008	21.6
	Matarma, 1948	2,000	2	...	..	333	1,768,052	14.6
	El Khaligue, 1980	1,600	...	...	1	...	188,760	29.4
	Abu Senan T&Y	6,000	7	5	8	1,883	2,171,085	...
SUCO/DEMINEX-BP-SHELL	• Ras Budran, 1978	11,400	...	16	...	34,182	36,431,963	25.0
	• LL 87-2, 1975	11,000	...	...	1	51	763,946	35.0
	• Ras Fanar, 1978	2,300	6	...	...	10,596	11,596,536	35.0
	• Zeit Bay, 1981	4,200	22	...	...	56,642	43,108,031	33.0
OSOCO/TOTAL	• Shukheir Bay, 1978	6,300	1	...	...	558	1,502,730	34.5
	• S. Ramadan, 1982	10,000	2	...	...	256	145,148	36.5
EPEDECO/JAPANESE	West Bakr, 1978	1,300- 1,500	...	20	5	4,224	9,137,892	18.0
BADR PETROLEUM/SHELL	Badr el din, 1982	10,800	5	...	...	10,043	9,500,000	38.5
AGIBA/DENISON MINES	Meleiha, 1972	6,000	...	...	12	...	440,266	40.0
GEYSUM OIL/MOBIL-CONOCO	• Geysum, 1980	5,500	5	...	...	5,496	1,218,228	17.0
SUESSO (ESSO)	• East Zeit, 1982	11,000	3	...	...	5,647	1,044,253	38.0
	Total Egypt		**139**	**536**	**452**	**778,836**	**3,786,858,548**	

	WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
				Flow	Artificial lift	Shut-in			
FRANCE	**ALSACE**	All fields	...	...	17	11	541	2,818,858	...
		Abandoned	...	...	...	...	...	24,309,334	...
	AQUITAINE BASIN	Lacq Superieur, 1949	2,170	10	34	13	934	25,045,994	22.3
		Parentis, 1954	7,710	2	66	5	6,896	192,967,809	33.4
		Lugos, 1956	5,250	...	24	1	857	9,521,267	20.8
		Cazaux, 1959	7,550	...	39	6	5,305	65,285,608	34.2-37.3
		Lavergne, 1962	11,480	...	4	...	414	11,930,627	41.7
		Pecorade, 1974	10,660	10	2	3	2,738	7,665,768	29.3
		Castéra-Lou, 1976	9,600	...	8	1	700	2,062,353	21.7
		Vic Bilh, 1979	7,100	8	14	17	5,225	11,520,531	26.6
		Lagrave, 1984	6,500	2	...	...	3,585	1,895,743	42.5
		Other	...	2	20	7	726	18,846,368	...
		Abandoned	...	...	...	...	...	70,857	...
	PARIS BASIN	Coulommes, 1958	6,230	...	35	13	489	12,991,372	32.6
		Châteaurenard, 1958	1,800	...	26	16	383	4,529,737	27.5
		Chailly, 1958	5,580	...	18	14	227	9,162,970	35.4
		St. Martin, 1959	4,590	1	10	4	350	8,172,805	33.0
		Villeperdue, 1959	6,100	...	65	24	9,430	4,337,420	34.4
		St. Firmin, 1960	1,800	...	38	20	610	1,510,585	27.5
		Chuelles, 1961	1,800	...	40	17	589	6,589,825	27.5
		Soudron, 1976	4,600	...	24	3	543	1,678,354	34.4
		Donnemarie, 1979	8,040	...	2	1	817	1,373,478	36.2
		Chaunoy, 1983	7,350	...	33	5	12,456	7,788,498	37.1
		St. Germain, 1984	7,200	2	5	3	2,087	690,881	36.0
		Other	...	6	82	58	3,029	22,662,264	...
		Abandoned	...	...	...	...	...	294,346	...
	SOUTHEAST + JURA	All fields abandoned	...	...	...	...	...	223,063	...
		Total France		**43**	**606**	**242**	**58,931**	**455,946,715**	
GABON	**ELF**(e)	• Anguille, 1962	9,200						31.2
		• Anguille NE, 1968	7,500						32.0
		• Anguille NNE, 1971	7,500						32.0
		• Barbier, 1972	6,000						29.5
		• Breme, 1976	5,000						36.5
		Clairette, 1956	4,400						29.0
		• Girelle, 1973	9,400						32.0
		• Gonelle, 1972	5,800						24.2
		• Grondin, 1971	7,500						16.4
		• Mandaros, 1972	4,900						19.8
		Olende, 1976	6,700						33.8
		• P.G.S. Marine, 1975	7,500	202	12	116	117,135	843,266,000	32.5
		• Port Gentil Ocean, 1964	6,500						33.0
		Tchengue, 1957	4,100						26.8
		• Torpille, 1968	8,200						35.8
		• Baliste, 1974	4,900						28.3
		• M'Bya Sud, 1969	6,700						35.4
		• Anguille SE, 1962	8,200						32.8
		• Ayol Marine, 1979	7,700						22.8
		• Baudroie N., 1980	7,500						34.5
		• Baudroie Marine, 1968	7,500						33.3
		Other	...						...
	SHELL/GABON/ELF	• Lucina-Marine, 1971	5,900	15		1	11,381	42,660,000	37.0
		Lucina-Marine W., 1982	...	...		...	1,421	957,000	37.0
	SHELL GABON	Gamba, 1963	3,000	31		9	6,781	149,127,000	32.4
		Ivinga, 1967	3,100	22		6	6,282	98,337,000	32.5
	AMOCO	Oguendjo B and C, 1981	5,000- 6,000	...	12	1	17,000	19,818,000	35.0
		Total Gabon		**294**		**133**	**160,000**	**1,154,165,000**	
GHANA(e)	**AGRI-PETCO**	• Saltpond, 1977	8,500	3	...	3	300	3,938,000	36.0-39.0
		Total Ghana		**3**	...	**3**	**300**	**3,938,000**	
GREECE	**N. AEGEAN PET. CORP.**	• Prinos, 1974	8,000- 8,800	16	...	...	27,200	41,525,300	30.6
		Total Greece		**16**	...	...	**27,200**	**41,525,300**	
GUATEMALA(e)		Rubelsanto, 1974	5,300- 7,000	...	4	...			26.0-30.0
		West Chinaja, 1977	3,200- 3,800	3	...	...			35.0-43.0
		Caribe, 1981	6,830- 7,280	NA	1	...	4,900	12,644,000	22.0-24.0
		Tortugas	2,300	...	...	2			35.0
		Tierra Blanca	11,230	...	...	1			19.5
		Total Guatemala		**3**	**5**	**3**	**4,900**	**12,644,000**	
INDIA	**GUJARAT STATE**	Ankleshwar, 1960	2,953- 3,937						
		Bakrol, 1968	4,593- 4,921						
		Kadi, N., 1968	2,953- 3,909						

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1966	Cumulative bbl to July 1, 1986	°API gravity
			Flow	Artificial lift	Shut-in			
	Kadi, S., 1968	5,906- 6,562	267	2,201	712	614,000	1,761,710,000	...
	Kalol, 1961	4,265- 5,250						
	Kathana, 1965	5,250- 5,906						
	Kholka, 1966	4,265- 5,577						
	Kosamba, 1963	1,968- 2,625						
	Nawagam, 1963	4,429- 6,652						
	Sanand, 1963	4,265- 4,593						
	Sobhasen, 1968	4,429- 5,906						
	Wovel, 1963	4,265- 4,593						
ASSAM STATE	Digboi, 1890	300- 7,500	203	570	714	53,335	9,653,711	...
	Geleki, 1968	12,632-12,795						
	Lakwa, 1965	8,038-12,795						
	Moran, 1958	11,000						
	Nahorkatiya, 1953	9,500						
	Rudrasagar, 1961	10,171-10,500						
MAHARASHTRA STATE	Bombay High, 1974	4,530- 4,630						
	Total India		**470**	**2,771**	**1,426**	**667,385**	**1,771,363,711**	
INDONESIA **PERTAMINA UEP I(e)**	Besitang, 1977	3,973	71	133	22	104,325	2,876,253,930	51.5
	Gebang, 1977	2,917						54.0
	K. Simpang, 1971	3,740- 5,019						45.0
	P. Tabuhan, 1937	3,350- 5,893						50.8
	Rantau, 1929	2,764						45.3
	Serang Jaya, 1926	3,701						47.5
	Other	...						...
PERTAMINA UEP II(e)	Benuang, 1942	6,103	70	342	1,007			35.1
	Benakat East, 1973	NA						NA
	Tempino, 1931	1,647						23.0
	Gn. Kemala, 1938	5,448						38.0
	Limau, 1928	3,896- 4,626						NA
	Ogan Timur, 1943	3,793						27.42
	Talang Jimar, 1937	4,123						31.0
	T. Miring, 1935	640						NA
	Tanjung Tiga, 1938	3,750						28.0
	Kenali Asam, 1931	2,077						29.0
	Belimbing	5,371						...
	Kuang, 1940	5,249						25.1
	Other	...						...
PERTAMINA UEP III(e)	Cemara, 1976	3,964- 7,104	33	55	96			...
	Jatibarang, 1969	3,063						29.0
	Tugu Barat, 1979	3,014						...
	Other	...						...
PERTAMINA UEP IV(e)	Bunyu, 1923	2,077	32	129	173			33.2
	Sangatta, 1939	1,842						33.0
	Tanjung, 1938	2,296						39.9
	Tapian Timur, 1967	4,396						38.8
	Warukin S., 1966	2,067						26.9
	Other	...						...
PERTAMINA UEP V(e)	Klamono, 1936	574	...	47	8			19.0
	Linda, 1977	3,281						19.0
	Sele, 1951	2,156						35.0
PERTAMINA (from Stanvac)(e)	Sago, 1940	1,800	NA	NA	NA			34.0
	Lirik, 1939	1,600						34.0
	Molek, 1956	2,600						34.0
	N. Pulai, 1941	1,800						34.0
	S. Pulai, 1941	1,800						34.0
	Talang Akar, 1922	2,800						35.0
	Benakat, 1932	1,600						35.0
	Jirah, 1930	2,300						35.0
	Rajah, 1940	6,000						38.0
	Abab, 1951	6,000						36.0
PERTAMINA (N.E. Kalimantan)(e)	Sembakung, 1976	2,600	11	6	2			36.0
	Bangkudulis, 1980	3,250	...	...	1			39.5
PHILLIPS GROUP(e)	Salawati, 1976	5,749	...	7	6			39.2
AARNL(e)	Bula	280- 700	...	49	57			22.5
IIAPCO(e)	● Cinta, 1970	3,500	...	42	3			34.0
	● Gita, 1972	5,000	1	6	2			34.5
	● Kitty, 1973	2,700	...	7	...			18.0
	● Nora, 1973	3,200	...	5	...			29.0
	● Rama, 1974	3,200	...	47	21			31.0
	● Selatan, 1971	4,000	...	11	4			19.5
	● Zelda, 1971	7,500	1	32	10			33.0
	● Krisna, 1979	4,500	...	33	5			37.0
	● Yvonne, 1980	4,500	...	10	1			36.0
	● Farida, 1982	8,000	...	18	4			32.0
	● Titi, 1982	8,000	...	...	4			33.0
	● Sundari, 1982	4,400	...	13	2			25.0
	● Duma, 1983	2,300	...	3	3			16.0
	● Karmila, 1983	4,800	...	5	1			36.0

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
PETROMER TREND[e]	Canderawasih, 1976	3,500	...	8	4			28.1
	Jaya, 1973	3,050	...	15	2			41.4
	Kasim, 1972	3,350	...	35	2			36.6
	Walio, 1975	2,750	...	181	32			33.8
	Other	...	...	8	6			...
LEMIGAS[e]	All fields, 1893-1909	2,155- 2,297	5	66	348			...
CALTEX	Aman, 1974	4,700	...	10	...	2,571	5,732,649,240	42.1
	Anatara, 1978	1,425	...	5	...	1,051		35.7
	Balam SE, 1972	4,500	...	13	...	678		29.6
	Baiam S., 1969	1,600	...	48	3	9,689		33.3
	Bangko, 1970	1,950	...	69	11	28,422		33.8
	Batang CPI, 1975	690	...	4	2	196		18.8
	Bekasap, 1955	2,950	...	48	11	15,289		33.4
	Bekasap S., 1968	3,900	...	8	6	1,022		34.1
	Benar, 1973	2,450	...	25	3	5,795		32.9
	Cebakan, 1974	4,700	...	4	...	566		30.1
	Garuk, 1980	4,600	...	2	...	46		30.6
	Hitam, 1975	6,690	...	4	...	1,357		38.7
	Intan, 1977	3,350	...	6	1	1,119		32.8
	Jorang, 1972	5,500	...	13	3	9,738		38.2
	Kerang, 1977	3,900	...	11	3	1,671		37.3
	Kopar, 1974	5,300	...	12	7	2,221		37.1
	Kotabatak, 1952	5,500	...	65	50	21,893		28.9
	Libo, 1968	6,000	7	1	3	1,641		34.3
	Libo SE, 1973	5,900	18	4	4	11,091		42.0
	Lincak, 1981	2,570	...	4	...	755		35.2
	Menggala N., 1968	3,850	...	14	4	5,234		32.5
	Menggala S. CPI, 1968	3,765	...	7	1	2,185		33.5
	Minas, 1944	2,600	...	408	131	204,943		34.7
	Mindal, 1971	3,400	...	2	1	125		36.0
	Mutiara, 1976	3,500	...	2	...	136		34.1
	Nella, 1977	5,000	...	3	...	262		34.7
	Obor, 1978	7,370	...	1	...	222		39.9
	Pager, 1974	4,300	...	23	2	8,030		37.3
	Pelita, 1977	6,600	1	4	...	862		38.4
	Pematang, 1959	3,750	1	35	8	8,148		31.6
	Pematang Bow, 1969	5,300	...	4	7	1,079		34.8
	Pemburu, 1981	2,300	...	7	...	3,351		35.3
	Perkebunan, 1977	2,300	...	1	...	29		29.4
	Petani, 1964	4,750	2	29	3	12,382		32.8
	Petapahan, 1971	4,500	...	21	7	5,843		27.9
	Pinang, 1971	3,950	...	19	3	3,282		32.4
	Pinggir, 1972	3,300	...	5	...	323		34.7
	Pinggir S., 1973	3,300	...	2	...	76		38.5
	Pudu, 1972	5,950	...	6	7	1,391		36.1
	Puncak, 1979	2,400	...	11	2	4,674		35.3
	Pungut, 1951	3,400	...	27	7	4,816		37.7
	Rangau, 1968	6,100	...	3	6	174		42.0
	Rantaubais, 1972	1,070	...	9	6	348		21.0
	Rokiri, 1979	6,100	...	...	2	...		41.3
	Seruni, 1972	3,000	...	22	2	3,608		35.7
	Sikladi, 1975	4,340	...	18	2	2,450		38.2
	Singa, 1977	3,200	...	1	...	44		31.0
	Sintong, 1971	3,400	...	19	1	2,735		32.2
	Sintong SE, 1973	4,500	...	1	...	40		36.1
	Suram, 1971	1,750	...	3	...	240		27.6
	Topaz, 1977	5,200	...	7	1	2,290		33.0
	Topi, 1979	3,630	...	1	...	63		36.7
	Tandun, 1969	3,000	...	9	1	745		34.3
	Telinga, 1975	4,205	...	7	3	948		33.6
	Tunas, 1983	4,819	...	2	...	201		35.0
	Ubi, 1976	4,350	...	20	1	1,763		35.8
	Waduk, 1982	6,100	...	10	3	1,173		37.6
	Duri, 1941	770	...	1,010	226	66,962		21.4
	Kulin, 1970	2,050	2	53	8	5,117		20.0
CAL ASIATIC TOPCO	Batang, 1975	690	...	7	3	457	227,063,995	19.2
	Buaya, 1978	2,[illegible]	...	1	...	16		28.0
	Lindai, 1971	[illegible]100	2	12	2	984		30.7
	Menggala S., 1968	3.765	...	1	...	1,133		33.5
	Tanjung Medan, 1976	2,770	...	2	5	760		37.6
	Benua, 1978	2,400	...	14	3	7,480		41.4
	Beruk, 1974	1,750	...	19	4	13,314		38.0
	Bungsu, 1976	2,050	...	7	1	2,749		38.4
	Damar, 1974	4,650	...	5	1	715		33.5
	Dusun, 1979	2,550	...	5	1	1,911		42.3
	Gatam, 1977	2,385	...	2	...	7		33.5
	Kasikan, 1972	660	...	18	6	975		27.3
	Beruk NE, 1976	1,800	...	3	2	212		40.0
	Osam, 1978	900	...	5	...	232		31.8
	Paitan, 1978	2,315	...	1	...	101		31.6
	Pedada, 1973	950	...	26	1	13,676		33.1
	Pusaka, 1977	2,250	...	17	4	4,364		34.6
	Sabak, 1974	2,350	...	13	...	2,516		35.8

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
			Flow	Artificial lift	Shut-in			
	Terantam, 1973	900	...	4	...	178		31.7
	Zamrud, 1975	3,600	...	42	2	28,012		40.3
	Langgak, 1976	1,380	...	18	2	1,393		31.7
STANVAC (Central Sumatra)	Binio, 1972	1,600	...	21	8	600	11,413,426	34.0
	Pekan, 1976	3,700	...	21	23	1,064	7,111,284	35.0
	Merbau, 1979	2,700	2	22	11	1,927	5,555,225	36.0
	Kerumutan, 1980	3,000	...	21	12	1,334	4,067 881	35.0
	N. Merbau, 1980	2,500	...	8	4	820	2,557,484	36.0
	Panduk, 1981	2,500	...	6	4	309	1,193,716	46.0
	Kayuara, 1982	3,700	...	7	5	535	1,312,474	35.0
	Gemuruh, 1983	2,800	...	15	2	1,844	693,616	34.0
	E. Kayuara, 1983	3,500	...	34	2	4,166	1,292,990	35.0
	Mutiara, 1985	2,700	...	2	...	128	797,023	34.0
	Other	4,600	...	...	1	...	9,175	...
STANVAC (South Sumatra)	Ibul, 1970	5,700	...	17	24	1,423	21,183,208	36.0
	Rambutan, 1972	4,500	5	1	17	173	3,169,935	42.0
	Tabuan (PSC)	4,000	4	4	2	2,318	419,610	34.0
	Other	4,500	3	1	5	209	797,023	...
ARCO	Ardjuna, 1969	2,380- 7,250	99	156	45	146,824	575,996,900	37.0
	Arimbi, 1972	2,943	...	11	1	2,127	21,171,100	33.0
ROY M. HUFFINGTON INC.	Badak, 1972	5,190-10,600	26	11	11	6,056	34,883,347	32.0
	Nilam, 1974	7,500-11,500	30	10	3	7,556	15,081,366	32.0
	Pamaguan, 1974	900- 5,100	3	11	7	2,365	4,475,557	30.0
	Mutiara, 1984	900- 5,800	11	...	7	2,657	1,489,037	30.0
	Semberah, 1974	2,900-10,100	...	...	16	...	7,041	35.0
TOTAL CFP	● Tamboza, 1984	...	...	...	...	6,000	3,100,000	53.0
	● Handil, 1974	...	...	...	...	134,000	552,400,000	33.0
	● Bekapai, 1972	...	...	...	...	17,000	145,100,000	41.0
UNOCAL	● Attaka, 1970	7,500	32	39	10	47,994	407,101,187	39.0
	● Melahin, 1972	7,500	4	2	...	822	5,752,783	23.1
	● Kerindingan, 1972	7,000	2	3	3	431	4,980,000	23.8
	● Sepinggan, 1973	11,150	6	7	4	6,356	38,316,160	34.0
	● Yakin, 1976	5,100	2	21	5	12,471	12,981,741	18.8
	● Rajah, 1981	5,500	2	1	...	2,200	2,700,021	33.8
ASAMERA (NORTH SUMATRA)	Geudondong, 1965	3,192	...	...	23	24	5,199,661	53.1
	Julu Rayeu, 1968	2,832	2	8	26	396	12,152,892	53.6
	Iee Tabeu, 1971	2,721	1	3	43	81	11,863,219	50.3
	Alur Cimon, 1972	3,098	...	...	24	13	1,378,939	50.8
	Tualang, 1973	2,631	3	11	39	3,521	28,141,145	49.9
	Peudawa, 1980	3,083	...	...	12	23	1,567,420	48.1
	Other	...	...	...	11	...	712,478	...
ASAMERA (SOUTH SUMATRA)	Kluang, 1913	2,591	5	27	42	954	33,278,269	42.6
	Mangunjaya, 1934	2,700	...	8	91	293	22,891,364	32.0
	Tanjung Laban, 1982	3,590	10	...	4	2,687	1,818,585	38.1
	Ramba, 1982	3,150	46	1	13	27,496	20,125,149	37.0
	Rawa, 1985	4,038	1	...	12	...	47,838	38.7
	Other	...	...	...	7	...	1,197	...
	Tempino, 1931	4,493	3	...	6	206	1,169,067	40.9
	Bentayan, 1932	4,446	...	5	3	906	189,522	22.0
	Panerokan, 1976	4,915	3	...	2	44	159,272	39.4
CONOCO GROUP	● Udang, 1974	5,595	2	19	6	10,301	50,160,186	40.0
MOBIL OIL	Arun, 1971	10,050	34	...	4	98,761	233,771,001	55.0
TESORO Indonesia Petorleum Company	Samboja, 1909	360- 4,380	1	25	99	584	64,109,030	21.0
	Sanga Sanga, 1897	275- 6,000	11	101	127	3,471	264,971,370	32.0
	Tarakan, 1906	200- 6,540	2	133	1,030	1,915	209,189,146	20.0
	Total Indonesia		**614**	**4,510**	**4,273**	**1,258,000**	**11,686,244,225**	
IRAN[e] **NIOC**	Agha Jari, 1936	7,440	58		31	2,013,000	34,699,843,000	34.0
	Ahwaz Asmari, 1958	8,150	73		12			32.0
	Ahwaz Bangestan, 1958	12,000	...		7			24.3
	Bibi Hakimeh, 1961	4,570	19		14			29.9
	Binak, 1959	10,440	...		4			29.9
	Chillingar, 1974	3,350	...		1			39.3
	Chesmeh Khush, 1967	10,700	...		4			27.7
	Dehluran, 1972	11,900	...		6			34.3
	Gachsaran, 1937	3,400	46		16			31.0
	Haft Kel, 1927	1,980	2		9			37.7
	Karanj, 1963	5,360	7		...			33.9
	Kharg, 1961	10,900	...		...			31.6
	Kupal, 1965	10,500	...		7			32.8
	Lab-e Safid, 1968	4,350	...		7			35.3
	Mansuri, 1963	7,100	4		4			28.4
	Marun, 1963	9,400	55		57			32.6
	Masjid-e Suleiman, 1908	1,600	7		17			39.3
	Naft Safid, 1938	5,000	5		14			36.8
	Paris, 1964	4,670	22		5			38.8
	Par-e Siah, 1964	4,250	...		1			37.7
	Pazanan, 1961	7,250	44		27			37.2

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
		Rag-e Safid, 1964	7,230		19	10			28.6
		Ramin, 1966	12,200		...	...			32.9
		Ramshir, 1962	8,750		...	3			27.6
		Sulabedar, 1971	3,400		...	1			30.4
		Naft-e Shah, 1923	2,000- 3,000		...	...			43.0
		• Bahregansar, 1960	9,000		...	...			30.0
		• Hendijan, 1968	11,000		...	...			23.0
		• Nowruz, 1966	8,200		...	...			21.0
		• Rakhsh, 1969	7,650		...	...			35.8
		• Rostam, 1966	7,000		...	...			34.4
		• Ardeshir, 1969	2,800		...	...			27.0
		• Cyrus, 1962	7,000		...	...			18.3
		• Darius, 1961	11,000		...	...			34.0
		• Fereidoon, 1966	7,000		...	...			28.5
		• Sassan, 1965	7,500- 8,100		...	...			34.0
		Total Iran			**361**	**257**	**2,013,000**	**34,699,843,000**	
IRAQ(e)		Ain Zalah, 1939	5,200- 6,500	NA	NA	NA	1,747,000	17,836,572,000	31.0
		Bai Hassan, 1953	4,800- 5,400						34.0
		Butmah, 1953	3,900						30.0
		Hamrin, 1973	2,000						...
		Jambur, 1954	5,500-12,500						38.0
		Kirkuk, 1927	2,800- 4,200						36.0
		Naft Khaneh, 1909	3,500						42.5
		Rumaila North, 1958	10,000						34.0
		Rumaila, 1953	10,800						35.0
		Zubair, 1949	11,000						34.2
		Abu Ghurab	...						27.7
		Buzurgan	...						27.7
		Jabal Fauqui	...						...
		Lahis	...						...
		Total Iraq		**NA**	**NA**	**NA**	**1,747,000**	**17,836,572,000**	
ISRAEL(e)	**LAPIDOTH**	Heletz-Brur, 1955	5,200	...	4	...	100	20,527,000	29.2
		Kochav, 1962	5,500	...	2	...			27.9
	OEIL	Ashdod, 1976	8,400	...	2	...			32.5
	EMOG	Gurim, 1984	3,280	...	1	...			17.0
		Total Israel		**...**	**9**	**...**	**100**	**20,527,000**	
ITALY	**AGIP**	Cavone, 1979	10,663-18,068	9	7	4	2,774	5,481,336	24.0
		Malossa, 1973	17,881-21,231	4	...	6	5,290	24,713,443	55.0
		Pisticci-S. Cataldo, 1960	6,820- 6,880	9	2	3	898	6,679,927	11.4
		Gela, 1956	11,280-11,350	47	16	9	6,715	93,138,366	10.0
		Perla	7,850	4	4	...	1,036	1,139,419	13.3
		Cela Mare	10,300	8	3	7	1,189	14,181,965	10.0
		Ragusa, 1954	5,760	30	30	10	4,322	123,804,962	...
		Nilde, 1977	4,545	1	...	1	9,874	12,920,741	38.9
		S. Maria	...	3	3	...	791	102,841	15.9
		Emilio S.	9,215	1	...	...	1,350	337,622	13.0
		Narciso	2,650	1	...	...	5,206	989,278	21.1
		Varius	...	18	...	38	1,970	20,588,048	...
		Other	...	16	...	49	610	19,868,762	2.8-55.9
	ELF(e)	• Santa Maria a Mare, 1974	7,900	11	...	...	6,585	21,295,000	23.0
		• Rospo Mare, 1975	4,600	...	3	...			11.0
		• Sarago Mare, 1979	5,200	6	...	...			8.0
		Total Italy		**152**	**68**	**78**	**48,000**	**325,372,948**	
IVORY COAST	**ESSO COTE D'IVOIRE(e)**	• Belier, 1975	6,500	4	10	...	4,990	14,300,000	...
	PHILLIPS-AGIP-SEDCO-PETROCI	• Espoir, 1980	6,500-11,000	6	...	2	14,476	21,215,181	32.3
		Total Ivory Coast		**10**	**10**	**2**	**19,466**	**35,515,181**	
JAPAN	**JAPEX**	• Aga-Oki, 1972	7,590	8	...	7	1,384	4,829,116	24.8
		Higashi-Niigata, 1965	4,500- 9,200	18	...	11	1,201	8,095,786	53.9
		Sarukawa, 1958	2,000- 3,200	12	24	41	623	10,290,483	32.3
		Yoshii, 1968	8,000	11	...	13	748	8,313,788	61.8
		Other	...	...	...	...	1,604	27,830,297	...
	IDEMITSU OIL DEVELOPMENT CO. LTD.	• Agaoki-Kita, 1982	4,950	8	...	...	4,167	1,695,054	33.0
	TEIKOKU OIL	Yabase, 1933	1,100- 5,800	...	57	14	342	32,852,002	33.0
		Minami-Aga, 1964	7,300- 9,600	9	4	13	511	13,369,039	38.5
		Minami-Nagaoka, 1984	13,200-15,100	3	...	9	710	418,971	55.7
		Hagashi-Kashiwazaki, 1970	6,000- 8,900	6	...	7	612	7,629,280	62.0
		Kubiki, 1959	1,100- 6,400	19	70	37	675	12,600,503	29.7
		Other	...	11	24	13	188	5,211,852	...
		Total Japan		**105**	**179**	**165**	**12,765**	**133,136,171**	

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
				Flow	Artificial lift	Shut-in			
KUWAIT(e)	KOC	Burgan, 1938	4,800	210	...	183	1,286,000	22,019,300,000	30.8
		Ahmadi, 1952	4,800	11	...	73			31.7
		Magwa, 1951	4,800	71	...	42			33.0
		Raudhatain, 1955	8,600	41	...	12			34.4
		Bahra, 1956	8,500	...	...	2			...
		Sabriya, 1957	8,300	9	...	35			36.3
		Minagish, 1959	10,000	1	...	20			34.4
		Umm Gudair, 1962	9,000	20	...	13			26.9
		Total Kuwait		**383**	...	**380**	**1,286,000**	**22,019,300,000**	
LIBYA	AGIP	Bu Attifel, 1968	14,300	25	...	8	124,670	696,197,000	41.0
		Rimal-Katib, 1965	14,000	2	...	4	1,380	3,064,000	35.0
	ELF(e)	El Meheiriga	10,500	2	...	...	1,200	466,000	46.0
	LNOC(e)	Arshad, 1966	10,100				902,750	14,840,860,000	42.0
		Jebel, 1962	8,100						38.0
		Majid, 1968	9,000- 9,800						...
		Don Mansour Unit	5,600						...
		Nasser, 1959	5,500- 7,600						38.0
		Lehib-Dor Marada Unit, 1965	9,500						50.0
		Raguba, 1961	5,400						43.0
		Beda, 1959	4,000						36.0
		Bualawn, 1972	6,000	NA	NA	NA			40.0
		Dor, 1967	6,400						33.2
		Kotla, 1963	5,500						34.0
		Sahabi B & D, 1961	9,000-10,000						39.0
		Sarir, 1961	9,000						37.2
		Amal, 1959	9,900						37.5
		Ora, 1962	7,250						40.2
		Ghani, 1978	6,000						40.0
		Bahi, 1968	3,500- 3,750						43.4
		Belhedan, 1962	7,000						33.6
		Dahra, 1959	3,100- 3,700						37.0-41.0
		Defa, 1969	5,400- 5,900						35.6
		Gialo, 1961	2,200- 6,300						35.7
		Harsh, 1978	7,400	...	491	...			34.6
		Khalifa, 1978	5,400- 7,000						34.6
		Masrab, 1978	10,000						39.6
		Samah, 1961	9,000						33.4
		Waha, 1960	6,000						36.0
		Zaggut, 1962	6,000						36.4
		Balat, 1983	5,100- 5,400						32.2
		Ali, 1975	3,900	...	1	1			50.0
		Almas, 1975	4,000	...	5	3			49.5
		Intisar A, 1967	9,750	8	...	11			45.0
		Intisar B, 1974	9,600	2	...	..			50.0
		Intisar C, 1967	9,650	1	...	5			37.5
		Intisar D, 1967	9,400	13	6	8			39.0
		Intisar E, 1968	5,300- 7,100	...	8	3			34.7
		Nafoora-Augila, 1966	2,200-10,000	13	...	42			35.5
		Aswad, 1978	6,250	8	...	...			46.0
		Sabah, 1977	5,500	...	36	2			42.0
		Zella, 1977	6,750	27	...	4			48.1
		Other	7,900- 8,900	..	1	1			40.4
		Fidaa, 1979	7,000	2	7	...			41.7
		Hakim, 1978	6,700	3	...	...			48.5
		Total Libya		**106**	**555**	**92**	**1,030,000**	**15,540,587,000**	
MALAYSIA	ESSO MALAYSIA(e)	• Bekok, 1976	5,500	23	...	7	290,497	497,452,000	47.0
		• Pulai, 1973	4,300	19	4	9			42.3
		• Tapis, 1975	6,700	70	...	36			45.0
		• Tembungo, 1971	6,000	10	1	4			38.0
		• Kepong, 1979	6,000	3	...	7			47.0
		• Tiong, 1978	5,800	28	...	14			47.0
		• Tinggi, 1980	4,400	26	...	5			48.0
		Irong Barat, 1979	3,300	10	...	2			35.0
		Semangkok, 1980	3,700	5	...	...			42.5
	SARAWAK SHELL BERHAD	• Bakau, 1971	11,000	2		1	297	6,954,000	39.0
		Baram, 1963	9,500	17		19	14,046	131,142,000	40.5
		Baronia, 1967	7,900	25		15	15,656	140,134,000	42.0
		Bayan, 1976	4,200	6		1	20,039	13,327,000	35.0
		Betty, 1967	7,900	8		6	22,403	53,755,000	38.0
		Bakor, 1972	2,000	9		2	18,727	18,990,000	35.0
		Siwa, 1973	...	...		...	1,921	548,000	25.0
		Temana, 1972	3,100	16		6	12,882	31,232,000	35.0
		Tukau, 1966	5,000	23		21	23,747	79,298,000	29.2
		West Lutong, 1966	5,600	11		16	7,164	116,297,000	39.5
	SABAH SHELL	• Barton, 1971	2,400	4		...	3,557	7,044,000	37.0
		• Erb West, 1972	6,875	9		5	8,408	18,122,000	30.0
		Ketam, 1977	...	...		...	1,811	328,000	30.0

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
			Flow	Artificial lift	Shut-in			
	Samarang, 1972	5,700	31		31	51,084	206,546,000	37.0
	South Furious, 1974	3,300	7		8	5,151	10,332,000	30.0
	• St. Joseph, 1975	2,200	3		6	8,610	11,759,000	32.0
	Total Malaysia		**370**		**221**	**506,000**	**1,343,280,000**	
MEXICO(e) **NORTH ZONE, NE**	Misión, 1945	5,440	3	...	...			...
	Monterrey, 1950	6,510	1	4	1			...
	Tigrillo, 1971	3,342	...	...	11			...
	Other	...	2	9	66			...
NORTH ZONE, N.	• Arenque, 1970	11,362	17	...	...			26.0
	Constituciones, 1956	6,350	76	100	...			17.0
	Ebano-Pánuco, 1901	1,450	141	183	...			12.0
	Tamaulipas	4,200	65	87	...			19.0
	Other	...	...	...	...			...
NORTH ZONE, S.	Chicontepec, 1973	4,264	219	1	...			34.1
	• Isla de Lobos, 1963	6,875	9	...	...			40.0
	• Marsopa, 1974	10,198	7	...	...			39.0
	Naranjos-C. Azul, 1909	1,800	206	...	...			22.0
	Tres Hermanos, 1959	6,960	34	...	...			21.0
	Other	...	...	...	...			...
CENTRAL ZONE, POZA RICA	• Atún, 1966	9,040	7	...	...			37.0
	• Bagre, 1973	10,919	8	...	...			33.0
	Escolín, 1942	7,216	...	95	...			26.3
	Hallazgo, 1955	10,170	...	36	...			25.0
	Jiliapa, 1958	7,390	...	29	...			24.0
	Mecatepec, 1941	7,544	1	31	...			29.8
	Miquetla, 1959	6,480	1	56	...			35.0
	Poza Rica, 1930	7,090	...	132	...			35.0
	Pres. Alemán, 1949	8,036	44	42	...			26.0
	Remolino, 1962	10,745	...	36	...			29.5
	San Andrés, 1956	10,410	5	118	...			29.0
	Other	...	114	201	1			...
CENTRAL ZONE, CUENCA DEL PAPALOAPAN	Matapionche, 1974	11,129	21	8	16			35.6
	Other	...	22	...	9			...
SOUTHERN ZONE, NANCHITAL	Ixhuatlán Ote., 1965	1,960	1	19	14			22.6
	Moloacán, 1962	500	1	169	37			22.3
	Santa Rosa, 1952	1,312	6	...	3			25.4
CENTRAL ZONE, N. FAJA DE ORO	Acuatempa, 1955	4,085	6	...	...			21.0
	Muro, 1965	3,966	11	...	8			17.0
	Ordónez, 1952	5,220	8	...	...			21.0
	Ocotepec, 1953	3,737	13	...	...			20.0
	Santa Agueda, 1953	4,780	3	...	...			16.0
	Other	...	50	7	...			...
SOUTHERN ZONE, EL PLAN	Agata, 1956	3,830	2	7	6			...
	Bacal, 1976	3,500	18	6	16			35.0
	Concepción, 1974	1,600	2	1	12			31.0
	Cuichapa, 1935	2,200	18	45	60			30.0
	El Plan, 1931	1,700	1	66	19			30.0
	Lacamango, 1973	1,700	8	10	9			26.3
	Los Soldados, 1953	4,492	3	15	4			32.0
	Other	...	19	7	12			...
SOUTHERN ZONE, AGUA DULCE	Blasillo, 1967	7,216	15	16	27	2,384,000	13,294,260,000	40.0
	Cinco Presidentes, 1960	6,862	10	63	61			35.0
	Burro, 1931	2,200	1	22	15			26.0
	Venta, 1954	4,730	3	17	63			41.0
	Ogarrio, 1957	5,790	14	43	137			38.0
	Otates, 1965	7,469	1	11	6			39.0
	Rodador, 1971	11,398	4	10	...			26.0
	Sánchez Magallanes, 1957	4,240	3	70	272			27.0
	San Ramón, 1967	9,517	5	24	36			30.0
	Tonalá, 1928	1,770	1	30	30			28.0
	Other	...	3	...	12			...
SOUTHERN ZONE, COMALCALCO	Agave, 1977	13,450	7	...	9			41.7
	Arroyo Zanapa, 1978	14,599	1	...	1			38.9
	Arteza, 1977	11,800	2	1	2			26.4
	Ayapa, 1972	8,200	3	...	2			7.2
	Cacho López, 1977	14,250	1	...	...			29.0
	Cáctus, 1972	14,100	14	...	16			31.5
	Carrizo, 1962	3,500	11	7	17			23.3
	Castarrical, 1967	10,080	19	19	21			29.3
	Comoapa, 1979	14,432	4	...	2			44.5
	Copano, 1977	11,890	9	...	1			43.9
	Cunduacán, 1974	13,775	8	4	30			28.9
	El Golpe, 1963	3,500	48	45	42			25.7
	Giraldas, 1977	15,225	21	...	1			37.0
	Iride, 1974	13,775	12	...	4			28.5
	Muspac, 1982	9,676	1	...	12			57.0
	Mecoacán, 1957	2,200	9	8	13			8.6
	Mora, 1981	...	61	...	2			38.1
	Mundo Nuevo, 1977	11.800	4	...	1			46.0

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
		Níspero, 1974	14,100	4	...	14			34.4
		Paredón, 1978	15,690	12	...	1			39.8
		Oxiacaque	11,150	5	...	16			29.1
		Platanal, 1978	15,900	...	...	...			30.2
		Río Nuevo, 1975	14,950	5	...	...			34.8
		Samaria (Cret), 1973	14,209	25	1	23			31.0
		Santuario, 1966	9,617	19	9	9			37.0
		Sitio Grande, 1972	13,766	19	...	3			35.0
		Sunuapa, 1978	12,887	2	...	5			32.8
		Tapijualpa, 1982	15,613	1	...	11			39.8
		Tintal, 1968	5,904	4	...	2			22.0
		Topén, 1978	11,172	2	...	1			25.4
		Tupilco, 1959	9,685	36	31	34			27.0
		Bellota, 1982	17,056	9	...	3			41.0
		Cardenas, 1979	17,548	26	...	19			38.0
		Chiapas, 1979	12,136	5	...	2			42.0
		Fenix, 1979	17,876	4	...	3			40.0
		Iris, 1979	14,432	8	...	...			39.2
		Jujo, 1980	17,548	18	...	1			32.0
		Caparroso, 1982	18,368	1	...	...			41.2
		Tecominoacan, 1983	19,519	1	...	4			37.5
		Jolote, 1983	18,119	1	...	...			39.4
		Artesa Terc., 1984	...	1	1	1			28.0
		Carmito, 1980	10,050	1	...	...			45.6
		Edén, 1983	17,590	1	...	1			38.5
		Samaria Terc., 1965	4,920	10	6	7			13.9
		Other	...	16	...	21			...
	GULF OF CAMPECHE	• Cantarell, 1976	8,528	63	...	12			21.3
		• Abkatun, 1978	11,800	25	...	10			30.0
		• Ku, 1979	10,000	8	...	7			22.0
		• Pol, 1979	12,600	8	...	...			35.0
		• Chuc, 1982	13,100	1	...	2			35.0
		• Ixtoc, 1984	...	1	...	1			35.0
		Total México		**1,779**	**1,958**	**1,352**	**2,384,000**	**13,294,260,000**	
MOROCCO(e)		Sidi Rhalem, 1962	6,265- 7,185	...	...	...	277	15,931,000	...
		Rharb, 1951	4,590	...	...	...	24	...	...
		Total Morocco		...	...	...	**301**	**15,931,000**	
NETHERLANDS	**UNOCAL**	• Helm, 1979	4,400	1	7	...	3,320	5,579,324	17.9
		• Helder, 1980	4,800	...	9	3	6,776	12,357,207	21.6
		• Hoorn, 1981	5,000	...	7	...	10,493	13,682,173	25.8
	NAM	DeLier, 1955	5,200	33		...	498	16,490,000	34.8
		Rotterdam, 1984	...	...		...	696	126,000	32.0
		Berkel, 1954	...	11		...	3,287	3,095,000	20.0
		Ysselm, 1956	5,200	77		9	4,062	86,135,000	22.0
		Pynacker, 1955	...	5		...	524	5,795,000	22.0
		Wassenaar, 1956	4,200	38		3	2,043	45,670,000	18.7
		Zoetermeer, 1957	3,200	22		...	614	5,711,000	16.5
		Schoonebeek, 1944	2,500	356		...	11,911	226,656,000	35.6
		Other	...	70		21	62	612,000	...
	CONOCO	Kotter, 1980	6,500	7	...	...	22,328	14,064,569	33.0
		Logger, 1982	6,500	7	...	...	10,153	2,434,667	33.5
	AMOCO	• Rijn, 1982	6,600	13	...	...	16,733	3,181,393	35.0
		Total Netherlands		**663**		**36**	**93,900**	**441,589,333**	
NEUTRAL ZONE(e)	**AOC**	• Khafji, 1961	4,400-10,300	111	...	11	234,000	4,079,725,000	28.2
		• Hout, 1969	5,300-10,500	48	...	21			33.0
	GETTY & KOC	Wafra, 1953	1,100- 7,000	2	310	80			18.9-23.5
		S. Fuwaris, 1963	6,300	...	6	3			25.0
		S. Umm Gudair, 1966	8,900	...	16	2			24.3
		Total Neutral Zone		**161**	**332**	**117**	**234,000**	**4,079,725,000**	
NEW ZEALAND(e)	**SHELL-BP-TODD**	• Kapuni, 1959	11,700	9		3	15,649	39,700,000	54.0
	MAUI DEVELOPMENT	• Maui, 1969	11,000	11		3	6,707	17,500,000	58.0
	PCNZ	McKee, 1981	7,838- 8,251	11	...	3	7,567	3,590,000	38.5
		Kaimiro, 1982	11,900	1	...	...	65		46.4
		Stratford	...	...	...	1	12		41.0
		Tariki	8,550	...	...	1	...		56.0
		Toe Toe, 1984	7,500	...	...	...	...		...
		Total New Zealand		**32**		**11**	**30,000**	**60,790,000**	
NIGERIA	**AGIP-PHILLIPS**	Akri, 1977	9,600-10,600	6	...	6	11,670	58,088,000	39.9
		Akri West, 1975	9,900-10,200	...	...	2	...	482,000	31.5
		Ashaka, 1968	9,700-12,000	1	...	...	640	2,087,000	41.0

	Name of field, discovery date	Depth, feet	No. of wells Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
	Beniku, 1974	12,000	1	...	1	580	3,282,000	44.3
	Ebegoro, 1976	11,500-12,000	6	...	3	8,660	54,655,000	35.7
	Ebocha, 1965	8,000-10,900	8	...	8	8,640	104,499,000	38.5
	Idu, 1973	7,750-10,700	...	...	10	...	23,853,000	28.0
	Kwale, 1968	10,000-11,500	2	...	6	1,730	2,987,000	44.3
	M'Bede, 1966	7,300- 9,400	9	...	5	15,200	149,509,000	41.1
	Obama, 1975	11,600-14,300	7	...	1	18,560	83,436,000	38.2
	Obiafu, 1973	9,300-12,200	11	...	6	11,710	73,318,000	41.3
	Obrikom, 1973	8,000-10,000	6	...	6	6,820	51,003,000	41.5
	Odugri, 1972	12,500	1	...	1	700	9,294,000	44.8
	Ogbogene, 1976	10,000	...	...	3	...	3,303,000	37.0
	Ogbogene W., 1981	13,000	...	...	1	...	353,000	56.2
	Okpai, 1968	10,000-12,000	7	...	1	5,390	15,718,000	42.3
	Omodu W., 1975	11,500	1	...	...	1,060	4,677,000	35.0
	Oshi, 1974	9,600-11,300	11	...	1	11,800	58,039,000	39.5
	Tebidaba, 1975	10,300-13,300	7	...	3	20,800	102,519,000	35.5
	Umuoru, 1975	14,100	3	...	1	2,470	3,425,000	43.0
	Agwe, 1977	10,800	1	...	...	670	1,845,000	55.0
	Clough Creek, 1977	10,000-12,400	9	...	...	9,460	15,128,000	43.0
	Beniboye N.	9,000-10,000	9	...	...	9,090	3,772,000	39.0
PHILLIPS	Gilli-Gilli, 1967	7,600-14,000	2	...	2	1,084	2,792,409	47.4
GULF OIL	Abiteye, 1970	5,750- 9,400	12	...	7	12,442	57,710,866	37.8
	• Delta, 1965	5,600- 9,500	20	...	7	21,127	154,742,526	34.0
	• Delta South, 1965	7,100-10,179	17	...	10	25,965	243,825,720	38.6
	• Isan, 1970	5,900- 9,000	7	...	4	3,056	41,092,080	39.4
	Makaraba	7,100-12,005	18	...	8	24,977	74,042,309	31.5
	• Malu, 1969	4,800- 6,300	12	...	6	20,678	89,321,684	40.0
	• Mefa, 1965	8,570-12,030	5	...	...	6,751	14,742,413	37.1
	• Meji, 1965	5,200-10,900	19	...	3	17,832	135,784,128	32.9
	• Meren, 1965	5,000- 7,500	31	...	19	57,513	441,777,008	31.3
	• Okan, 1964	5,500- 9,245	43	...	24	40,034	410,501,603	36.0
	• Parabe/Eko, 1968	4,500- 8,200	13	...	10	7,581	95,232,881	36.7
	Utonana, 1971	7,400- 9,165	1	...	4	767	7,565,777	35.6
	• W. Isan, 1971	7,825-10,229	5	...	4	3,390	32,731,195	38.1
	Yorla South, 1974	11,389-12,635	...	...	2	...	822,618	41.0
	Jisike, 1975	6,300- 7,600	3	...	1	2,316	4,785,949	44.0
	Robertkiri, 1964	11,484-13,190	11	...	1	4,181	4,308,725	41.0
	• Tapa, 1978	8,150-10,842	9	...	1	12,181	19,526,267	36.0
ASHLAND(e)	Izombe-Ossu, 1974	9,500	16	...	6	1,109,475	8,402,750,000	43.0
	• Akam, 1980	7,000	9	...	...			36.0
ELF(e)	Aghigo, 1972	...	13	...	6			25.7
	Okpoko, 1967	...	13	...	7			23.0
	Obodo-Jatumi, 1966	...	15	...	7			31.1
	Upamini, 1965	...	8	...	7			19.8
	Obagi, 1964	...	51	...	4			24.0
	Erema, 1972	...	2	...	2			35.4
MOBIL(e)	• Adua, 1967	6,970	4	...	1			30.3
	• Asabo, 1966	5,600	6	...	4			32.4
	• Ekpe, 1966	8,200	5	...	3			30.3
	• Ekpe-WW, 1977	6,810	9	...	1			30.3
	• Eku, 1966	5,420	4	...	2			30.8
	• Enang, 1968	6,600	19	...	2			35.1
	• Etim, 1968	6,200	9	...	...			32.9
	• idoho, 1966	9,020	2	...	...			30.8
	• Inim, 1966	5,850	8	...	1			37.8
	• Mfem, 1967	5,200	3	...	...			36.1
	• Ubit, 1968	5,400	34	...	3			36.1
	• Unam, 1968	5,180	6	...	3			33.5
	• Utue, 1966	5,700	5	...	2			36.8
	• Isobo, 1968	4,345	2	...	2			30.8
	• Iyak	NA	7	...	1			38.7
	Asabo 'D'	...	1	...	...			...
INPEX(e)	Ogharefe, 1973	9,900	7	...	5			47.4
SHELL (MIDWEST)(e)	Ugh-Ogini, 1964	5,860	4	...	...			19.0
	Ugh-Uzere-East, 1960	8,500	6	...	...			23.0
	Ugh-Uzere-West, 1964	8,500	4	...	...			23.0
	Ugh-Olomoro, 1963	7,000-10,000	11	...	...			22.0
	Ugh-Oweh, 1964	12,300	6	...	...			28.0
	Ugh-Kokori, 1960	8,000- 9,800	4	...	...			42.0
	Ugh-Afiesere, 1966	8,000- 9,000	13	...	...			22.0
	Ugh-Eriemu, 1961	12,500	12	...	...			26.0
	Ugh-Ughelli-East, 1959	11,800	5	...	...			35.0
	Ugh-Ughelli-West, 1963	7,400-10,200	2	...	...			21.0
	Ugh-Utorogu, 1964	9,000	7	...	...			25.0
	Ugh-Oroni, 1964	12,000	1	...	...			22.0
	Ugh-Warri-River, 1961	12,264	1	...	...			31.0
	Ugh-Evwreni, 1968	10,900	4	...	...			28.0
	Ugh-Isoko, 1960	NA	1	...	...			19.0
	Forc-Odidi, 1967	10,980	6	...	...			37.0
	Forc-Opukushi, 1963	7,823	4	...	...			29.0
	Forc-Jones Creek, 1967	7,000- 9,000	11	...	...			29.0
	Forc-Opuama, 1973	NA	1	...	...			41.0
	Forc-Egwa, 1967	9,350	8	...	...			37.0

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
			Flow	Artificial lift	Shut-in			
	Forc-Forcados/Yokri, 1968	10,859	39	...	...			22.0
	Forc-Batan, 1968	11,000	3	...	...			27.0
	Forc-Escravos Beach, 1969	9,931	1	...	...			36.0
	Forc-Otumara, 1969	8,176	7	...	...			25.0
	Forc-Saghara, 1970	8,590	1	...	...			31.0
	Forc-Ajuju, 1970	13,324	...	...	...			27.0
	Forc-Benisede, 1973	...	4	...	...			23.0
	Node-Sapele, 1970	12,788	11	...	...			42.0
	Node-Oben, 1972	12,036	17	...	...			40.0
	Forc-Opukushi N., 1977	NA	...	...	...			30.0
	Abura	...	3	...	...			44.8
	Rapele	...	...	...	...			44.4
SHELL (EAST)[e]	Phl-Bomu, 1958	6,500- 7,500	10	...	...			36.0
	Phl-Imo River, 1959	5,800-10,000	24	...	...			32.0
	Phl-Nkali, 1963	12,000	1	...	...			42.0
	Phl-Elelenwa, 1959	11,000	1	...	...			39.0
	Phl-Umuechem, 1969	5,800-10,700	5	...	...			36.0
	Phl-Apara, 1960	9,000	4	...	...			36.0
	Phl-Bodo-West, 1959	9,700	1	...	...			29.0
	Phl-Afam, 1956	6,000	8	...	...			45.0
	Phl-Yorla, 1970	11,917	8	...	...			44.0
	Phs-Bonny, 1959	12,254	11	...	...			36.0
	Phs-Cawthorne Channel, 1963	11,000	17	...	...			38.0
	Phs-Ekulama, 1958	10,483	16	...	...			32.0
	Phs-Soku, 1958	11,500	8	...	...			31.0
	Phs-Orubiri, 1971	NA	2	...	...			38.0
	Egb-Oguta, 1965	10,300	8	...	...			46.0
	Eade-Utapate South, 1974	NA	5	...	...			44.0
	Eade-Opobo South, 1974	NA	6	...	...			44.0
	Ibigwe	...	2	...	...			...
	Korokoro	...	3	...	...			34.3
	Otamini	...	1	...	...			21.8
	Ugada	...	1	...	...			...
	Ahia	...	8	...	...			38.2
	Akpor	...	2	...	...			27.5
	Alakiri	...	4	...	...			38.2
	Assa	...	2	...	...			20.7
	Egbema West	...	8	...	...			42.2
	Ebubu	...	2	...	...			22.2
	Egbema	...	6	...	...			35.5
	Cesw-Nun River, 1960	NA	4	...	...			39.0
	Cesw-Etelebou, 1971	12,000	9	...	...			33.0
	Cesw-Kolo Creek, 1960	12,000	14	...	...			42.0
	Cesw-Diebu Creek, 1966	NA	17	...	...			43.0
	Phl-Isimiri, 1964	5,900-11,000	4	...	...			28.8
	Phl-Onne, 1965	10,384	3	...	...			29.0
	Phl-Obigbo-North, 1963	6,500-10,000	23	...	...			22.0
	Phl-Ajokpori, 1967	NA	1	...	...			29.0
	Phl-Agbada, 1960	8,000-12,000	24	...	...			32.1
	Phl-Akuba, 1967	NA	1	...	...			29.0
	Cesw-Adibawa, 1967	11,950	7	...	...			26.0
	Cesw-Adibawa NE, 1973	NA	2	...	...			26.0
	Cesw-Ubie, 1961	14,380	...	...	...			28.0
	Phl-Obeakpu, 1975	NA	1	...	...			45.0
	Cosw-Nembe Creek, 1973	NA	17	...	...			35.0
	Phs-Akaso, 1979	NA	1	...	...			30.0
TEXACO-CHEVRON[e]	● Pennington, 1965	5,000-10,400	3	...	8			37.5
	● Middleton, 1972	5,000- 7,000	7	...	3			37.5
	● North Apoi, 1973	4,000- 8,100	5	...	23			36.5
	● Funiwa, 1978	5,000- 7,000	3	...	16			37.5
	● Sengana, 1967	...	2	...	...			38.5
	Total Nigeria		**1,111**	**...**	**297**	**1,517,000**	**11,059,338,158**	
NORWAY **PHILLIPS**	● Ekofisk, 1968	10,000	37	...	9	96,687	862,701,075	41.1
	● West Ekofisk, 1970	10,300	11	...	...	9,299	78,606,865	43.9
	● Cod, 1968	9,500	6	...	...	3,599	18,389,286	55.0
	● Tor, 1970	10,000	10	...	3	12,769	108,699,678	38.0
	● Albuskjell, 1972	10,400	8	...	2	7,009	47,470,371	45.0
	● Edda, 1972	10,480-10,600	6	...	1	2,632	22,101,539	41.5
	● Eldfisk, 1970	9,350-10,000	18	...	...	60,672	190,385,384	37.6
MOBIL	● Statfjord, 1974	7,700	49	...	...	*523,202	810,450,000	39.0
AMOCO	● Valhall, 1972	8,200	19	...	...	43,250	53,601,231	35.0
CONOCO	● Murchison, 1975	9,900	14	...	...	*21,468	47,772,000	39.0
	Total Norway		**178**	**...**	**15**	**†780,587**	**2,240,177,429**	
OMAN **PDO**	Lekhwair, 1968	4,352	11	17	26	17,000	46,939,000	37.8
	Natih, 1963	4,788	21	17	25	27,000	328,691,000	31.0
	Shibkah, 1976	2,591	2	...	...	...	600,000	31.0
	Fahud, 1964	2,499	37	78	79	68,000	713,978,000	32.7
	Yibal, 1962	8,465	21	117	8	141,000	522,606,000	40.2

*Norway's production share. †Total includes about 30,000 b/d of NGL.

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
			Flow	Artificial lift	Shut-in			
	Al Huwaisah, 1969	5,320	1	34	3	18,000	156,508,000	37.0
	Burhaan, 1984	4,011	2	...	...	1,000	921,000	36.7
	Ghaba North, 1972	2,227	3	10	6	13,000	43,463,000	35.8
	Saih Nihaydah, 1972	8,700	2	12	8	27,000	130,421,000	39.0
	Saih Rawl, 1973	9,826	8	7	9	10,000	81,776,000	41.1
	Qarn Alam, 1972	1,354	...	4	2	2,000	18,317,000	14.8
	Habur, 1975	5,800	...	1	1	...	4,220,000	14.8
	Mahjour, 1979	11,700	2	...	2	1,000	1,709,000	37.2
	Al Ghubar, 1974	1,916	2	3	1	4,000	2,153,000	23.5
	Barik, 1974	8,856	3	...	...	2,000	245,000	42.1
	Anzauz, 1984	7,098	2	...	...	5,000	2,152,000	47.8
	Hasirah, 1984	8,708	...	...	1	...	192,000	48.8
	Zauliyah, 1981	8,177	8	6	...	8,000	7,040,000	45.2
	Wafra, 1983	5,510	4	...	...	2,000	323,000	40.6
	Suwaihat, 1982	6,452	5	...	2	8,000	3,353,000	36.0
	Bahja, 1984	5,697	4	...	...	4,000	1,667,000	44.5
	Fayyadh, 1983	3,608	...	1	...	1,000	...	27.0
	Sayyala, 1981	3,690	10	...	1	27,000	5,271,000	49.7
	Zareef, 1985	3,264	...	3	...	1,000	...	46.9
	Rima, 1979	3,247	8	26	1	73,000	70,440,000	32.8
	Rasha, 1982	4,310	...	3	2	...	512,000	32.8
	Nimr, 1980	3,296	...	10	...	9,000	1,782,000	21.3
	Karim West, 1982	3,546	...	7	4	10,000	3,873,000	23.5
	Amal/Amal South, 1973	4,638	...	5	5	4,000	3,036,000	22.5
	Birba, 1978	8,528	...	...	2	1,000	7,029,000	33.4
	Kaukab, 1983	8,282	1	...	...	2,000	422,000	35.8
	Marmul, 1977	5,087	...	151	5	46,000	86,386,000	22.0
	Rahab, 1977	3,237	...	18	5	3,000	3,532,000	22.0
	Qaharir East, 1978	4,936	...	1	2	...	600,000	30.6
	Qata, 1979	4,707	...	10	4	2,000	2,471,000	26.2
	Qaharir, 1978	4,536	...	22	5	8,000	16,946,000	30.6
ELF GROUP	Sahmah, 1978	12,400	5	...	...	7,000	19,879,000	45.1
OCCIDENTAL PETROLEUM	Safah, 1983	6,500	11	...	...	2,537	1,456,103	37.8
	Total Oman		**173**	**563**	**209**	**554,537**	**2,290,909,103**	
PAKISTAN **PAKISTAN OILFIELD LTD.**	Balkassar, 1946	9,398	...	3	2	454	31,305,0000	26.0
	Joya Mair, 1944	6,900	...	2	...	272	5,577,000	15.0
	Dhulian, 1936	8,899	...	...	...	43	41,299,000	48.0
	Khaur, 1915	9,306	...	1	...	11	4,163,000	...
PAKISTAN PETROLEUM LTD.	Adhi,(c) 1978	9,118- 9,190	3	...	...	955	1,417,000	48.5
OGDC	Toot, 1968	15,125	8	...	2	1,904	8,566,000	38.0
	Fimkassar, 1982	11,465	1	...	...	25	21,000	39.0
	Tando Alam, 1984	7,546- 8,205	8	...	1	4,124	2,598,000	41.4
UNION TEXAS	Khaskeli, 1981	3,500	7	..	2	3,579	5,568,609	39.0
	Laghari, 1983	2,500	5	...	1	9,068	5,762,964	42.0
	Dabhi, 1984	5,500	2	...	2	1,900	425,823	39.0
	Other	...	...	...	9	...	...	31.0-46.0
OCCIDENTAL	Dhurnal, 1984	13,100	3	...	...	15,014	7,119,910	38.0
	Total Pakistan		**37**	**5**	**19**	**37,349**	**113,823,306**	
PERU **PETROMAR S.A.**	• Peña Negra, 1960	3,000- 8,500	28	149	94	12,000	97,558,899	38.0
	• Lobitos, 1960	3,500- 7,500	13	136	115	10,131	45,170,182	38.0
	• Litoral, 1955	1,500- 6,000	4	112	31	3,343	34,890,946	36.0-40.0
	• Providencia, 1967	3,000- 7,000	1	42	31	1,004	19,876,450	38.0-40.0
	Other	...	4	1	7	198	131,948	...
OCCIDENTAL	• Bartra, 1979	8,000- 8,930	...	13	3	7,164	13,901,563	11.5
	• Capahuari Sur, 1973	11,800-12,900	...	16	8	13,230	122,780,700	35.6
	• Dorissa, 1978	9,800-10,600	...	10	2	12,710	29,377,566	34.0
	• Forestal, 1973	9,000- 9,900	...	8	2	7,818	28,905,094	26.7
	• Huayuri Sur, 1977	10,000-10,800	...	10	2	4,760	14,762,052	29.3
	• San Jacinto, 1978	7,200- 9,760	...	16	6	10,524	22,701,483	13.1-23.5
	• Shiviyacu, 1973	9,100-10,100	...	14	4	14,528	46,834,354	20.8
	• Jibaro, 1974	10,110-10,155	...	6	...	3,648	4,495,079	11.3
	• Jibarito, 1981	9,000- 9,650	...	5	...	5,169	6,118,153	10.8
	Other	...	1	3	4	444	1,676,259	...
OCCIDENTAL/BRIDAS	Talara area*	1,343- 6,080	3	1,000	288	9,375	40,427,206	34.0
PETROPERU	Talara-Lima area, 1869-1905	2,000- 9,000	143	1,740	3,875	27,452	931,164,639	34.1
	Corrientes, 1971	10,000-12,600	2	30	6	28,951	75,026,083	29.8
	Pavayacu, 1972	9,600-11,300	...	13	1	3,698	13,850,134	30.2
	N. Esperanza, 1980	10,200-10,700	...	2	3	1,863	4,009,114	44.0
	Yanayacu, 1974	11,400-13,600	...	8	1	1,569	3,061,622	19.1
	Capirona, 1972	9,800-12,000	...	4	1	1,009	2,878,096	25.3
	Valencia, 1975	10,500-11,200	...	2	1	183	497,257	44.0
	Other	...	5	33	22	699	24,932,202	...
	Total Peru		**204**	**3,373**	**4,507**	**181,470**	**1,585,027,081**	

*Secondary recovery project

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
				Flow	Artificial lift	Shut-in			
PHILIPPINES	ALCORN	• South Nido, 1977	...	3	...	2	1,735	14,697,964	27.0
	PHILIPPINES	• Matinloc, 1979	...	5	...	...	3,367	7,265,692	42.9
	ALCORN PALAWAN	• Cadlao, 1977	5,800	2	...	...	2,746	7,987,869	47.4
		Total Philippines		**10**	**...**	**2**	**7,848**	**29,951,525**	
QATAR(e)	QGPC	• Bul Hanine, 1970	6,000	14	...	1	334,000	3,881,335,000	35.0
		Dukhan, 1940	6,500	116	...	45			41.1
		• Idd El Shargi, 1960	4,500- 8,250	25	...	6			35.0
		• Maydan-Mahzam, 1963	7,000	19	...	5			38.0
		Total Qatar		**174**	**...**	**57**	**334,000**	**3,881,335,000**	
RAS al KHAIMAH	GULF	• Saleh, 1983	14,500	6	...	...	11,067	7,602,815	50.0
		Total Ras al Khaimah		**6**	**...**	**...**	**11,067**	**7,602,815**	
SAUDI ARABIA(e)	ARAMCO	Abqaiq, 1940	6,690	NA	NA	NA	4,463,000	51,718,535,000	37.0
		Abu-Hadriya, 1940	9,340						35.0
		• Abu-Safah, 1963	6,600						30.0
		• Berri, 1964	8,300						32.0-34.0
		Dammam, 1938	4,800						35.0
		Fadhili, 1949	8,050						39.0
		Ghawar, 1948	6,920						34.0
		Harmaliyah, 1971	8,430						35.0
		Khurais, 1957	5,200						33.0
		Khursaniyah, 1956	6,560						31.0
		• Manifa, 1957	7,950						29.0
		• Marjan, 1967	6,800						33.0
		• Qatif, 1945	7,100						33.0-34.0
		• Safaniyah, 1951	5,100						27.0
		• Zuluf, 1965	5,800						32.0
		Total Saudi Arabia		**NA**	**NA**	**NA**	**4,463,000**	**51,718,535,000**	
SHARJAH	CRESCENT(e)	• Mubarek,(c) 1972	...	1	3	...	8,620	76,398,600	37.0
	AMOCO	Saaja and Moveyid,(c) 1980	10,200-12,300	16	...	...	56,380	68,089,583	50.0
		Total Sharjah		**17**	**3**	**...**	**65,000**	**144,488,183**	
SPAIN	SHELL ESPANA	• Amposta Marino North, 1970	10,000	2	...	1	1,506	54,673,000	37.0
	CHEVRON	Ayoluengo, 1964	4,600- 5,200	...	35	16	2,100	13,936,052	33.0
		• Casablanca, 1975	8,000	7	...	...	32,200	62,815,295	34.0
	SHELL/CAMPSA	• Castellon, 1976	9,000	3	...	...	919	14,366,000	35.0
	ENIEPSA	• Salmonete, 1974	12,600	...	...	...	2,281	1,526,023	44.0
		• Tarraco	...	...	...	...	897	14,417,859	...
		Total Spain		**12**	**35**		**39,903**	**161,734,229**	
SURINAME	STAATSOLIE	Tambaredjo, 1981	984	...	47	...	1,750	1,111,000	15.8
		Total Suriname		**...**	**47**	**...**	**1,750**	**1,111,000**	
SYRIA(e)	S.P.C.	Alian, 1974	5,900	3	8	...	185,000	896,215,000	19.0
		Gbebeh, 1976	2,300	12	17	...			18.0
		Jebisseh, 1968	2,000- 3,300	23	112	...			18.0
		Karchok, 1968	6,500	3	83	...			20.0
		Rumilan, 1962	6,500	[illegible]	39	...			24.0
		Soudie, 1959	6,500	[illegible]	449	...			24.0
		Tichrine, 1976	2,600	4	16	...			18.0
		Other	...	6	60	...			...
		Total Syria		**63**	**784**	**...**	**185,000**	**896,215,000**	
THAILAND	UNOCAL	• Erawan, 1973	7,000	71	...	40	7,112	10,971,600	54.6
		• Baanpot, 1980	7,000	...	...	10	529	1,025,600	54.6
		• Platong, 1976	8,500	35	...	7	4,697	2,064,700	59.1
		• Satun, 1980	8,500	38	...	19	3,609	1,706,600	55.1
	THAI SHELL	Sirikit, 1981	5,258- 5,976	34	...	9	19,370	18,170,296	41.0
		Sirikit West, 1983	5,500	2	...	...	546	233,112	41.0
		Total Thailand		**180**	**...**	**85**	**35,863**	**34,171,908**	
TRINIDAD	AMOCO	• Teak, 1971	15,191	15	38	...	36,812	208,577,992	29.3
		• Samaan, 1971	11,780	10	26	...	13,860	167,132,740	36.8
		• Poui, 1974	11,650	10	21	...	28,434	136,934,562	34.0
		• Cassia, 1973	12,700	5	...	...	7,023	7,155,148	45.0
	T.N.A.	• Soldado, 1955	11,000	74	264	...	37,608	442,286,083	...
		Fortin Offshore (FOS), 1954	...	1	10	...	260	6,844,046	...

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
			Flow	Artificial lift	Shut-in			
TRINTOPEC	Palo Seco/Erin/McKenzie, 1926	12,718	57	446	...	9,141	112,224,259	...
	Fyzabad/Apex/Quarry, 1920	11,000	9	310	...	3,855	168,352,728	...
	Coora/Quarry, 1936	14,000	3	181	...	1,778	90,045,889	...
	Galeota, 1963	6,304	...	51	...	3,282	13,529,105	...
	Other	...	14	334	...	4,927	66,631,901	...
TRINTOC*	Area IV & Guapo, 1913	10,626	17	53	...	1,204	37,942,902	...
	Parrylands, 1913	10,626	22	90	...	1,844	39,249,804	...
	Point Fortin C & W, 1907	10,626	35	106	...	2,748	39,421,525	...
	Point Fortin E., 1929	11,000	2	53	...	831	26,228,352	...
	Penal, 1936	11,067	15	64	...	1,152	61,501,495	...
	Catshill, 1950	9,693	1	37	...	409	22,839,118	...
	Brighton, 1908	7,500	5	62	...	781	72,289,301	...
	Barrackpore, 1911	11,100	14	40	...	2,193	29,569,010	...
	Guayaguayare, 1902	10,750	1	122	...	1,682	85,584,391	...
	Forest Reserve, 1913	11,000	15	280	...	4,481	256,544,067	...
	Oropouche, 1944	9,100	...	35	...	191	6,544,649	..
	Palo Seco, 1929	12,700	11	67	...	2,119	91,906,570	...
	Trinity, 1956	9,700	...	12	...	162	15,003,256	..
	Other	...	16	64	...	912	77,694,811	...
P.C.O.L	All fields	...	7	86	...	807	20,192,005	...
	Total Trinidad		**359**	**2,852**	**...**	**168,496**	**2,302,225,709**	

*Texaco fields were purchased by Trintoc in 1985

TUNISIA

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
ELF-ETAP(e)	● Ashtart	10,500	6	8	1			29.8
ELF-Serept(e)	Douleb/Semmama	1,500- 2,500	...	14	...	23,665	177,340,000	39.3
	Tamesmida	2,500	...	3	...			36.8
CFTP	Sidi El Itayem, 1971	7,500- 7,800	...	18	2	1,100	19,130,000	44.0
	Other	...	...	...	...	...	655,000	...
ETAP-AGIP-FINA (SODEPS)	Makrouga, 1980	6,230	3	...	...	2,420	2,358,507	45.0
	Larich, 1979	7,550	1	...	...	130	233,624	40.7
	Debech, 1980	7,550	1	...	...	103	196,436	42.6
SHELL/AGIP/ETAP	● Tazerka, 1979	4,111- 4,232	5	...	...	6,121	10,827,443	30.0
AGIP-TUNISIA (Sitep)	El Borma, 1964	8,250- 8,900	47	40	14	73,046	457,344,417	42.5
	Chouech es Saida, 1971	12,600	1	...	...	415	2,234,586	42.9
	Total Tunisia		**64**	**83**	**17**	**107,000**	**670,320,013**	

TURKEY

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
SHELL	Barbes, 1971	...	...	14	2	1,938	14,651,000	29.7
	Baysu, 1964	...	...	...	...	369	67,000	33.3
	Bektas, 1985	...	...	...	...	334	160,000	33.7
	Beykan, 1964	...	...	28	4	3,485	56,831,000	33.2
	Cobantepe, 1975	...	...	...	...	50	209,000	32.8
	Katin, 1971	...	...	...	...	100	3,618,000	29.5
	Kayakoy, 1960	...	...	15	5	1,350	18,644,000	38.2
	Kayakoy-West, 1964	...	...	13	4	2,922	27,429,000	34.7
	Kervan, 1982	...	...	...	...	15	3,000	30.3
	Kurkan, 1963	...	...	12	1	2,586	47,068,000	31.4
	Kurkan-South, 1965	...	...	12	1	350	6,363,000	34.5
	Malatepe, 1970	...	...	11	...	1,001	6,481,000	32.7
	Piyanko, 1968	...	...	...	...	100	1,418,000	35.5
	Sahaban, 1965	...	...	9	4	834	12,651,000	34.5
	Sincan, 1979	...	...	6	...	816	2,248,000	31.4
	Yatir-East, 1973	...	...	4	6	633	4,815,000	30.9
	Yenikoy-East, 1974	...	...	2	...	200	3,536,000	31.3
	Yesildere, 1985	...	...	...	...	183	33,000	34.7
MOBIL	Selmo, 1964	5,800	1	18	1	5,160	62,806,537	34.2
	Bulgurdağ	4,500	1	...	2	43	2,444,661	37.9
TPAO	Raman, 1940	4,500	...	98	3	5,194	46,174,040	18.7
	Bati Raman, 1961	4,200	...	68	9	1,837	32,506,660	13.3
	Garzan, 1956	4,700	...	18	...	1,104	32,076,831	26.2
	Germik, 1968	6,500	...	7	2	551	3,074,393	18.8
	Mağrip, 1961	5,700	...	7	2	314	14,297,439	18.4
	Silivanka, 1962	8,200	...	10	...	900	7,192,926	23.0
	Beycayir, 1976	7,700	...	2	...	33	158,070	26.1
	Celikli, 1964	10,500	...	7	...	2,925	1,629,118	35.2
	Sezgin, 1970	5,600	...	...	...	...	87,559	17.0
	Oyuktas, 1972	7,600	...	...	...	...	592,005	31.0
	Devecatak, 1973	4,800	...	1	...	29	211,461	37.0
	K. Osmancik, 1971	3,800	...	2	...	253	1,892,900	37.6
	Adiyaman, 1971	5,800	...	11	1	699	7,650,314	27.6
	G. Adiyaman, 1977	5,000	...	...	...	...	115,836	20.4
	Kuzey Adiyaman, 1977	9,500	...	...	...	...	59,325	32.0
	Bölükyayla, 1977	10,300	...	...	...	...	167,663	35.0
	Saricak, 1973	5,250	...	4	...	239	2,444,095	31.5
	G. Saricak, 1973	5,250	...	11	...	542	3,482,904	31.5
	Yeniköy, 1973	6,400	...	13	...	1,278	7,767,285	31.4
	G. Kayaköy, 1976	8,600	...	3	...	195	1,752,512	30.4
	Sivritepe, 1977	8,200	...	1	...	20	465,004	33.4
	Camurlu, 1976	5,600	...	9	2	278	639,778	12.2
	Ikiztepe, 1976	4,900	...	...	...	...	88,051	11.3
	G. Sahaban, 1978	5,450	...	9	...	1,451	1,805,977	33.2

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
		G. Dincer, 1981	5,350	...	11	...	900	3,882,710	16.7
		Selmo B. Selmo, 1981	5,500	...	1	1	228	361,940	34.0
		Mehmetdere, 1982	6,700	...	1	...	12	149,057	31.0
		Karteltepe, 1982	6,550	...	2	...	383	974,501	32.0
		Cemberlitas, 1983	6,500	...	18	...	4,593	3,758,529	30.5
		Alcik	6,500	...	1	...	83	39,903	32.0
		Cukurtas, 1985	...	...	1	1	240	167,076	36.0
		B. Kozluca, 1985	...	...	7	2	503	84,628	12.0
		Akpinar, 1984	10,500	...	1	...	67	17,950	31.6
		B. Firat, 1986	8,150	...	1	...	511	73,505	34.8
		Total Turkey		**2**	**469**	**53**	**47,831**	**447,318,143**	
UNITED KINGDOM	**AMOCO**	• Montrose, 1969	8,200	3	10	...	13,957	68,483,938	40.5
		• NW Hutton, 1975	12,000	2	17	...	52,785	61,921,527	36.0
	BP	Wytch Farm Bridport Sand, 1974	2,910	...	8	3	2,763	6,995,459	37.0
		Wytch Farm Sherwood Sandstone, 1977	5,115	1	1	3	3,492	3,401,424	38.0
		East Midlands, 1939	3,500	...	65	55	1,307	24,507,386	36.0
		Kimmeridge, 1960	1,800	...	1	2	157	2,757,406	40.0
		Welton, 1983	5,000	1	13	4	348	442,877	36.0
		Nettleham, 1983	3,850	...	1	...	279	153,226	35.0
		• Forties, 1970	7,000	43	...	12	372,170	1,627,535,575	37.0
		• Buchan, 1974	8,700	6	...	2	22,266	47,310,213	33.0
		• Magnus, 1974	9,500	9	...	...	125,782	123,087,338	39.0
	BRITOIL PLC	Thistle, 1973	9,000	31	...	2	52,846	284,842,652	38.0
		Beatrice A, 1976	6,750	...	14	3	27,117	58,153,349	39.0
		Beatrice B, 1976	6,500	...	8	...	13,052	11,957,222	39.0
		Deveron, 1972	9,000	2	...	...	5,616	3,986,831	38.2
		Clyde, 1978	12,400	...	...	...	...	...	...
	CHEVRON	• Ninian, 1974	10,000	48	...	17	214,300	679,318,000	35.0
	CONOCO	• Statfjord, 1974	9,500	50	30	...	*33,000	42,606,000	39.0
		Murchison, 1975	9,900	17	9	...	*21,170	53,199,000	38.0
		Hutton, 1973	10,000	13	8	2	*15,680	8,759,000	33.0
	HAMILTON BROS. OIL & GAS LTD.	• Argyll, 1971	9,000- 9,400	2	5	...	11,100	58,400,000	38.0
		• Duncan, 1980	9,600-10,000	4	...	...	9,600	13,600,000	36.0
		• Innes, 1983	12,300-12,600	2	...	...	5,800	2,600,000	45.0
	MARATHON OIL COMPANY	• Brae South, 1975	12,700-13,437	12	...	...	97,879	85,886,193	35.0
	MOBIL	• Beryl, 1972	9,900-11,500	27	10	4	95,039	304,241,129	37.4
	OCCIDENTAL	• Claymore, 1974	8,100	...	24	3	75,978	266,600,000	30.1
		• Piper, 1973	8,100	13	11	2	170,613	717,896,000	37.0
		• Scapa, 1981	8,100	...	1	...	8,735	3,460,000	32.0
	SHELL	• Auk, 1971	NA	10		1	9,432	70,507,000	38.0
		• Brent, 1971	NA	54		12	402,220	873,902,000	37.8
		• Cormorant, 1972	NA	7		6	47,361	58,672,000	36.0
		• Cormorant N., 1974	NA	10		1	100,998	122,181,000	34.9
		• Dunlin A, 1973	NA	20		4	36,496	224,406,000	36.0
		• Fulmar, 1975	NA	...		12	156,962	178,410,000	40.0
	PHILLIPS	• Maureen, 1973	8,000- 8,700	...	...	20	71,992	75,445,191	36.0
	TEXACO NORTH SEA	• Tartan, 1974	10,217-12,614	6	2	4	20,830	43,170,000	37.0-42.0
		• Highlander, 1976	8,759- 9,372	2	1	...	27,820	12,430,000	34.0-37.0
	UNOCAL	• Heather, 1973	10,800	8	19	1	16,983	63,395,036	34.3
*Net production Conoco (UK) Ltd. only		**Total United Kingdom**		**403**	**258**	**175**	**2,343,925**	**6,284,619,972**	
YEMEN, NORTH	**HUNT OIL**	Alif, 1984	NA	45		...	10,000	NA	...
		Total North Yemen		**45**		**...**	**10,000**	**NA**	
VENEZUELA(e)	**PDV/ ANZOA-TEGUI**	Boca, 1971	9,500	7	3	70			33.0
		Caico Seco, 1946	6,500- 7,300	8	9	88			37.3
		Chimire, 1948-52	7,000- 7,200	29	22	147			36.0
		Dacion, 1957	6,700	3	79	61			21.3
		Elias, 1954	5,000- 6,470	36	35	94			36.6
		El Roble, 1939	3,500-11,500	20	...	40			51.3
		Guara, 1946	5,000-10,000	14	135	212			26.0
		Inca, 1948	7,250	10	7	33			32.9
		Leona, 1938	2,200-12,800	11	83	210			21.4
		La Ceiba, 1946	9,450	18	5	13			43.8
		Mata, 1954	8,970-10,516	45	27	333			34.1
		Merey, 1937	5,400- 5,700	8	118	482			11.4
		Nipa, 1945	6,000- 8,500	14	24	262			29.5
		Oscurote-Norte, 1952	9,513	4	12	60			22.1
		Oficina, 1937	5,900	14	138	332			21.6
		Soto, 1950	9,500	6	...	21			38.9
		Sta. Ana, 1936	8,500	63	2	43			44.3
		San Joaquin, 1939	6,550	44	...	54			53.2
		Sta. Rosa, 1941	8,500	135	5	62			48.4
		Yopales, 1937	4,600	7	102	145			22.2

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
	Zanjas, 1958	13,270	7	1	8	1,572,000	39,623,800,000	35.4
	Zapatos, 1955	11,500	17	5	45			37.0
	Zorro, 1953	11,100	6	4	20			28.3
	Zulus, 1957	12,710	5	5	12			39.8
	Zumo, 1954	9,200	3	2	31			17.9
	La Ceibita, 1963	9,878	17	6	23			41.3
	Adjuntas, 1957	5,000	...	...	53			13.9
	Other	...	141	219	793			...
PDV/MONAGAS	Acema, 1960	...	13	17	28			23.9
	Aguasay, 1955	8,100-13,400	5	3	32			41.7
	Jobo, 1956	3,600- 4,000	...	202	212			12.0
	Morichal, 1958	3,312	...	35	160			10.6
	Orocual, 1953	2,954	5	18	27			27.0
	Oritupano, 1950	7,657	...	...	65			22.8
	Pirital, 1958	450- 1,100	...	51	27			17.0
	Quiriquire, 1928	7,000- 7,200	...	39	434			16.3
	Sta. Barbara, 1941	5,020- 6,500	6	36	274			29.8
	Tacat, 1953	1,820- 3,670	...	43	90			17.0
	Temblador, 1936	3,500- 4,500	...	18	28			19.2
	Other	...	72	212	749			...
PDV/ZULIA	Boscan, 1946	...	...	272	197			10.2
	Bachaquero, 1930	...	25	1,064	2,687			20.2
	Cruces-Manueles, 1916	3,000- 8,000	2	25	105			30.9
	Cabimas, 1917	2,200	8	392	817			23.4
	Centro, 1959	9,600-11,000	31	78	64			35.6
	La Concepcion, 1953	3,148- 8,000	2	61	99			35.1
	La Paz, 1925	4,268- 8,000	9	53	94			30.5
	Lago, 1959	11,450	30	5	36			31.7
	Lagunillas, 1926	3,000	76	2,034	3,136			21.5
	Lama, 1957	8,320	116	96	168			32.8
	Lamar, 1958	13,000	35	46	98			34.5
	Mara, 1945	5,240	14	145	275			22.0
	Mene Grande, 1914	4,130	...	304	296			18.4
	Motatan, 1952	...	6	22	2			20.3
	Sibucana, 1948	13,450	...	1	2			32.2
	Tia Juana, 1928	3,000	10	2,012	1,035			17.9
	Urdaneta, 1970	10,000	9	125	128			23.3
	West-Tarra, 1942	4,250- 5,500	8	7	28			41.3
	Other	...	51	107	249			...
PDV/BARINAS	Hato, 1965	9,550	1	12	5			27.3
	Maporal, 1957	10,950	...	1	12			28.9
	Paez, 1963	NA	...	26	38			20.2
	Silvan, 1949	10,860	1	9	8			29.3
	Silvestre, 1948	8,860	...	21	27			25.3
	Sinco, 1953	8,500- 9,100	1	50	33			24.0
	Other	...	3	126	146			...
PDV/FALCON	All fields	...	...	10	125			24.7
PDV/GUARICO	Budare, 1958	4,523	7	3	70			31.5
	Las Mercedes, 1942	4,500	2	24	158			22.8
	Ruiz, 1949	4,500	...	7	35			32.0
PDV/AMACURO	Tucupita	...	3	...	64			16.6
	Total Venezuela		**1,243**	**8,860**	**16,110**	**1,572,000**	**39,623,800,000**	
WEST GERMANY								
BAVARIA	Arlesried, 1964	4,900		120	...	711	12,818,355	47.0
	Moenchsrot, 1958	4,800				305	11,398,169	36.0
	Other	...				4,004	34,763,962	...
EMSLAND	Emlichheim, 1964	2,600		1,092	...	3,631	42,646,363	25.0
	Georgsdorf, 1944	1,800- 2,600				6,376	98,955,349	24.0-29.0
	Meppen, 1960	4,000				974	11,850,305	28.0-30.0
	Ruehlermoor, 1949	2,000- 4,700				8,903	134,829,243	28.0-30.0
	Ruehlertwist, 1949	2,350- 2,900				1,998	30,509,476	25.0
	Scheerhorn, 1949	3,550- 3,750				2,911	49,185,890	30.0
	Other	...				1,683	30,106,762	...
SCHLESWIG-HOLSTEIN	Ploen-Ost, 1959	6,400		224	...	1,331	48,183,379	36.0
	Preetz, 1962	8,350- 8,550				375	10,709,007	29.0
	Reitbrook, 1937	1,450- 2,100				1,544	37,871,634	29.0
	Schwedeneck-See, 1978	5,250				8,727	3,486,835	27.0
	Other	...				1,383	51,622,615	...
HANNOVER	Eldingen, 1949	4,750		846	...	799	18,886,493	35.0
	Hankensbuettel, 1954	4,450- 5,100				4,078	91,097,676	33.0
	Hardesse, 1958	4,300- 5,900				749	9,232,912	34.0
	Hohne, 1958	4,300- 5,900				937	38,553,670	33.0-34.0
	Leiferde, 1956	2,600				478	19,952,959	34.0
	Lueben, 1955	3,950				786	11,266,405	35.0-38.0
	Meckelfeld, 1938	1,000- 1,300				374	13,973,218	24.0-32.0
	Oelheim-Sued, 1968	7,650				769	6,940,784	33.0
	Oerrel-Sued, 1954	4,450				1,126	12,431,626	...
	Ruehme, 1954	1,950				713	9,510,411	...
	Sinstorf, 1960	6,750- 7,150				683	18,277,691	...

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
	Suderbruch, 1949	3,750- 7,550				605	22,481,393	19.0-38.0
	Vorhop, 1952	2,950- 6,900				2,542	16,625,632	36.0
	Other	...				3,413	239,981,324	...
UPPER RHINE VALLEY	Landau, 1955	3,950- 4,800		129	...	1,110	24,495,535	36.0
	Other	...				798	12,572,352	...
WESER-EMS	Barenburg, 1953	2,300- 3,300				2,493	35,712,439	29.0
	Bockstedt, 1954	3,750				1,268	19,912,851	...
	Bramberge, 1958	2,560- 3,300				5,913	92,206,653	29.0
	Dueste, 1954	2,600- 4,250		718	...	410	40,110,422	...
	Gross Lessen, 1969	3,300				1,005	21,083,532	...
	Sued-Oldenburg, 1950	1,700- 6,500				1,302	38,501,054	...
	Voigtei, 1953	1,150- 1,500				722	23,898,025	31.0-34.0
	Wehrbleck, 1947	3,400				842	15,465,162	33.0
	Other	...				3,436	31,766,291	...
*As of Dec. 31, 1985	**Total West Germany**			***3,129**	...	**82,207**	**1,493,873,854**	

ZAIRE

	Name of field, discovery date	Depth, feet	Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1986	Cumulative bbl to July 1, 1986	°API gravity
GULF OIL	● GCO, 1970	7,000- 9,000	7	...	...	590	6,061,982	29.0
	● Mibale, 1973	5,000- 6,000	7	...	...	15,700	73,481,984	30.0
	● Mwambe, 1979	6,150	...	2	...	199	552,860	30.4
	● Motoba, 1976	11,098	1	...	...	117	160,315	44.3
	Lukami, 1983	12,400	4	...	...	4,700	4,289,179	35.0
	Libwa, 1981	5,500	...	...	2	...	...	...
ZAIREP	Liawenda, 1972	3,900	13	14	5	2,701	1,611,763	31.0
	Kinkasi, 1972	3,700	29	12	1	4,005	4,480,707	31.0
	Makelekese, 1983	3,600	3	5	...	666	450.045	31.0
	Muanda, 1972	3,600	2	4	...	563	272,508	31.0
	Kifuku, 1983	3,400	1	...	...	44	22,449	31.0
	East Mibale, 1978	6,000	2	2	1	2,778	1,866,054	34.0
	Tshiende Nsiam Fumu, 1977	8,300	...	...	1	...	5,185	34.0
	Total Zaire		**69**	**39**	**10**	**32,063**	**93,255,031**	

Production in the U.S. dropped 2% in 1968.

Survey of operating refineries worldwide (capacities as of Jan. 1, 1987)

				Charge capacity, b/cd							Production capacity, b/cd					
Country	No. plants	Crude, b/cd	Vacuum distillation	Thermal operations	Catalytic cracking	Catalytic reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alkyla-tion	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
Abu Dhabi	3	185,250	43,700	....	....	29,569	24,300	....	95,138	....	....	....	....	....	....
Algeria	4	464,700	15,000	....	....	55,600	....	....	23,600	....	1,900	2,400	5,300	....	....
Angola	1	32,100	1,900	....	....	1,900	....	2,800	3,800	....	....	....	950	....	....
Argentina	11	669,800	203,900	120,800	110,750	38,300	23,900	....	58,100	4,650	....	5,150	17,600	19.0	900
Australia	10	626,100	148,300	....	181,800	154,600	....	26,200	237,500	17,100	5,600	10,700	10,400	....	....
Austria	1	204,000	68,000	17,000	24,000	31,000	....	68,000	49,300	....	9,500	2,300	5,850	....	....
Bahrain	1	250,000	144,000	19,000	36,000	17,100	....	45,000	35,100	1,300	....	....	4,500	26.2	....
Bangladesh	1	31,200	3,530	....	....	1,650	....	2,430	1,940	....	....	....	1,200	....	....
Barbados	1	3,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Belgium	4	647,500	298,100	65,500	102,000	80,300	....	154,600	230,200	7,710	....	....	25,300	46.0	....
Bolivia	3	46,930	2,100	....	....	14,158	....	....	14,613	....	....	500	54	....	....
Brazil	13	1,321,100	685,200	41,100	321,900	21,600	....	....	132,700	3,300	....	16,000	29,984	20.1	1,265
Brunei	1	10,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Burma	2	26,300	4,800	1,700	....	....	....	....	....	....	....	....	....	....	40
Cameroon	1	43,000	....	....	....	6,500	....	10,000	10,000	....	....	....	....	....	....
Canada	27	1,759,700	602,600	76,100	370,300	345,100	150,800	23,200	704,950	70,045	47,300	22,400	105,100	252.3	791
Chile	3	150,450	74,000	8,400	34,000	5,300	....	....	....	1,000	....	....	....	....	....
China, Taiwan	2	542,500	111,700	17,493	22,600	51,960	18,080	135,600	97,010	3,200	14,938	3,960	1,500	140.0	1,050
Colombia	4	226,000	120,000	61,000	91,000	6,000	....	....	33,700	10,280	4,860	2,660	2,500	15.8	....
Congo	1	21,000	....	....	....	2,000	2,000	....	3,500	....	....	....	....	....	....
Costa Rica	1	15,600	600	6,500	....	1,200	....	....	3,400	....	....	....	....	....	....
Cyprus	1	16,000	1,800	....	....	3,400	....	....	6,000	....	....	....	700	....	....
Denmark	3	166,000	22,000	72,800	....	29,900	....	10,000	61,900	....	....	....	8,000	....	....
Dominican Republic	2	44,000	....	....	....	8,300	....	....	20,200	....	....	....	....	0.4	....
Ecuador	3	87,600	28,520	12,600	12,600	2,780	....	....	2,780	....	....	....	1,240	....	....
Egypt	7	452,110	46,725	16,470	....	30,940	....	....	84,386	804	1,452	3,848	6,633	5.5	541
El Salvador	1	17,000	1,900	....	....	3,000	....	....	12,100	....	....	....	600	....	....
Ethiopia	1	18,000	1,600	....	....	2,200	....	....	4,100	....	....	....	570	....	....
Finland	2	241,000	77,000	46,300	41,800	55,100	14,200	104,500	73,040	3,780	....	....	7,600	20.0	....
France	15	1,834,050	427,650	167,400	252,300	239,300	13,500	277,900	504,400	9,925	15,600	20,100	40,650	28.0	....
Gabon	1	15,600	...	7,200	....	1,400	....	....	4,500	....	....	....	....	....	....
Germany	19	1,719,800	537,300	269,400	186,200	317,000	96,200	326,700	690,950	11,300	35,090	7,900	64,640	156.5	1,920
Ghana	1	28,000	....	....	....	5,550	....	....	....	....	....	....	....	....	....
Greece	4	384,500	71,400	19,520	27,200	31,300	....	15,600	98,300	4,400	4,250	3,100	5,600	....	....
Guatemala	1	16,000	....	....	....	3,000	....	...	5,000	....	....	...	....	....	....
Hondures	1	14,000	....	....	....	1,800	....	....	5,000	....	....	....	....	....	....
Hungary	3	241,500	116,500	....	20,000	26,000	....	....	84,900	....	10,400	2,500	9,600	....	....
India	12	991,070	331,0[illegible]7	104,730	129,408	26,690	6,500	13,800	71,820	....	4,250	15,500	50,343	9.5	675
Indonesia	6	635,800	196,900	81,500	....	60,700	99,900	15,400	91,700	....	....	5,000	8,700	145.1	....
Iran	4	530,000	215,200	80,800	....	63,845	93,180	3,120	34,225	....	....	6,000	12,450	70.0	....
Iraq	8	318,500	82,650	....	....	43,500	38,000	100,000	13,000	....	....	10,168	6,715	64.0	....
Ireland	1	56,000	....	....	....	11,000	....	5,500	11,000	....	....	....	....	....	....
Israel	2	180,000	90,000	70,000	20,000	26,000	....	45,000	30,000	....	....	....	3,000	....	....
Italy	21	2,678,700	708,700	345,130	276,000	296,600	55,000	298,600	591,400	37,045	56,100	29,600	45,170	38.6	1,050
Ivory Coast	2	73,000	41,500	....	....	13,500	14,000	....	13,000	....	....	....	6,000	5.2	....
Jamaica	1	35,500	2,000	....	....	3,540	....	....	19,600	....	....	....	1,000	....	....
Japan	46	4,790,050	1,532,940	80,520	502,750	561,420	50,950	1,497,400	1,943,910	5,980	38,600	46,780	59,241	859.0	600
Jordan	1	100,000	16,900	...	4,410	8,640	4,230	....	13,860	....	....	....	....	7.9	....
Kenya	1	95,000	....	....	....	9,000	....	....	33,000	....	....	....	....	....	....
Korea	6	862,000	35,000	30,000	....	63,200	7,000	21,000	95,000	....	14,600	5,500	16,100	17.4	....
Kuwait	4	618,000	217,000	....	30,000	51,000	159,000	337,000	36,000	....	....	....	....	507.4	....
Lebanon	2	37,000	12,730	....	7,250	7,492	....	7,392	3,100	....	....	....	409	....	....

Survey of operating refineries worldwide (capacities as of Jan. 1, 1987)

				Charge capacity, b/cd						Production capacity, b/cd					
Country	No. plants	Crude, b/cd	Vacuum distillation	Thermal operations	Catalytic cracking	Catalytic reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alkylation	Aromatics-isomerization	Lubes	Asphalt	Hydrogen (MMcfd)	Coke (t/d)
Liberia	1	15,000	1,000	....	....	2,000	....	....	3,300	....	....	....	200	....	....
Libya	3	329,400	3,432	....	....	14,582	....	....	37,226	....	....	....	1,716	....	....
Madagascar	1	16,350	....	....	....	2,600	....	....	5,500	....	....	....	....	....	....
Malaysia	4	212,300	4,750	....	....	21,410	....	5,000	53,000	....	....	....	....	....	....
Martinique	1	12,800	....	....	....	3,000	....	....	8,350	....	....	....	....	....	....
Mexico	9	1,349,000	600,700	82,000	267,000	137,800	18,000	....	486,000	9,000	23,900	11,000	9,000	70.0	1,287
Morocco	2	81,303	13,160	....	5,600	13,735	....	....	19,642	....	....	1,514	....	....	....
Mozambique	1	17,000	1,500	....	....	2,500	....	2,500	....	....	....	....	900	....	....
Netherlands	7	1,400,800	253,370	148,710	125,500	150,400	30,000	183,200	511,820	4,700	....	4,700	14,500	86.0	....
Netherlands Antilles	1	320,000	158,000	67,000	42,000	15,000	....	....	121,500	5,600	....	8,000	8,000	....	....
New Zealand	1	54,000	....	....	....	26,000	....	6,800	40,000	....	....	....	....	....	....
Nicaragua	1	14,500	2,000	....	....	2,800	....	....	8,400	....	....	....	800	....	....
Nigeria	3	250,400	66,600	....	44,100	38,100	....	....	63,330	....	....	4,900	14,100	....	....
Norway	3	240,000	3,000	86,500	....	29,150	....	16,500	59,500	....	3,000	....	2,000	....	480
Oman	1	48,082	....	....	....	9,644	....	....	12,425	....	....	....	....	....	....
Pakistan	3	130,000	14,200	....	....	5,750	....	....	27,800	....	1,250	3,815	4,050	0.1	....
Panama	1	100,000	14,000	....	....	7,500	....	....	30,000	....	....	....	5,000	....	....
Paraguay	1	7,500	....	....	....	....	....	....	....	....	....	....	....	....	....
Peru	6	175,560	37,290	....	21,670	1,680	....	....	....	....	....	1,080	1,530	....	....
Philippines	3	286,000	38,100	....	23,100	40,200	....	23,500	90,700	4,400	....	....	5,000	....	....
Portugal	3	294,300	53,200	....	10,100	35,400	9,400	46,000	47,339	....	6,500	2,939	[illegible]	....	....
Puerto Rico	2	121,000	59,300	....	12,000	5,800	15,000	10,000	15,700	1,000	....	6,800	200	17.0	....
Qatar	1	62,000	....	....	....	22,030	....	....	39,640	....	....	....	....	....	....
Saudi Arabia	6	1,125,000	67,655	26,000	10,000	86,900	68,100	39,000	207,000	....	8,000	....	12,700	181.0	....
Senegal	1	29,800	18,800	....	....	2,870	....	....	2,870	....	....	....	....	....	....
Sierra Leone	1	10,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Singapore	5	961,000	170,500	133,000	....	50,600	44,200	76,700	288,400	....	....	7,000	7,700	39.0	....
Somalia	1	10,000	....	....	....	....	....	....	....	....	....	....	....	....	....
South Africa	5	388,500	177,000	59,500	81,400	57,800	18,000	66,300	125,150	9,100	5,100	3,000	7,140	34.0	....
Spain	10	1,305,000	291,800	124,000	92,500	187,100	15,000	156,100	284,000	....	23,720	9,300	23,550	47.2	3,400
Sri Lanka	1	50,000	1,900	12,500	....	3,750	....	2,100	15,300	....	....	....	950	....	....
Sudan	1	23,800	....	....	....	1,700	....	....	7,400	....	....	....	....	....	....
Sweden	5	436,500	108,000	68,000	25,500	74,000	....	92,000	119,500	3,300	....	2,500	28,500	....	....
Switzerland	1	65,000	....	24,000	....	15,000	....	8,000	27,000	....	....	....	....	....	....
Syria	2	228,790	60,611	41,199	....	19,348	....	26,040	37,863	....	....	....	8,036	9.5	685
Tanzania	1	13,500	....	....	....	3,000	....	....	5,000	....	....	....	....	....	....
Thailand	3	191,860	24,950	9,600	9,250	25,300	....	10,000	99,600	....	....	....	3,600	4.7	....
Togo	1	20,000	....	....	....	4,400	....	....	7,600	....	....	....	....	....	....
Trinidad	2	300,000	171,000	18,000	25,000	31,000	....	104,500	41,800	2,650	2,800	2,700	2,000	....	....
Tunisia	1	34,000	....	....	....	3,300	....	....	....	....	....	....	....	....	....
Turkey	4	460,475	124,768	....	38,600	45,057	....	4,777	132,100	....	....	3,830	17,741	0.4	108
United Kingdom	15	1,779,700	625,090	166,000	345,500	367,500	19,000	131,600	770,590	47,550	50,815	17,100	28,450	77.4	1,900
Uruguay	1	45,000	12,000	....	5,000	3,000	....	....	8,000	....	....	....	3,000	....	....
Venezuela	7	1,224,700	551,500	122,000	179,400	6,000	....	275,600	....	61,050	18,400	6,900	47,900	109.0	100
Virgin Islands	1	600,000	190,000	40,000	....	125,000	....	130,000	290,000	....	45,000	....	....	....	....
Yemen, N.	1	10,000	....	....	....	2,500	....	....	....	....	....	....	....	....	....
Yemen, S.	1	170,000	10,000	....	....	12,000	....	....	....	....	....	....	....	....	....
Yugoslavia	7	482,513	76,609	12,030	10,000	62,608	7,200	11,793	61,878	....	14,500	3,100	22,025	140.0	137
Zaire	1	17,000	....	....	....	3,000	....	....	5,000	....	....	....	....	....	....
Zambia	1	25,000	2,400	....	....	5,600	....	....	9,000	....	....	....	960	....	....
Total	**422**	**40,116,443**	**11,350,537**	**3,079,002**	**4,177,488**	**4,656,348**	**1,114,640**	**4,974,752**	**10,618,954**	**340,169**	**467,425**	**322,244**	**851,622**	**3,269.2**	**16,929**

Worldwide refining

AILLEEN CANTRELL
Director of Editorial Surveys

All figures in barrels per calendar day

All figures are as of 1-1-87

LEGEND

Numbers identify processes in table

Thermal processes
1. Gas oil cracking
2. Thermal cracking
3. Visbreaking
4. Fluid coking
5. Delayed coking
6. Other

Catalytic cracking
1. Fluid
2. Other

Catalytic reforming
- Semiregenerative:
  1. Conventional catalyst
  2. Bimetallic catalyst
- Cyclic:
  3. Conventional catalyst
  4. Bimetallic catalyst
- Other:
  5. Conventional catalyst
  6. Bimetallic catalyst

Catalytic hydrocracking
1. Distillate upgrading
2. Residual upgrading
3. Lube-oil manufacturing
4. Other

Catalytic hydrorefining
1. Residual desulfurization
2. Heavy gas oil desulfurization
3. Cat cracker and cycle stock feed pretreatment
4. Mid distillate
5. Other

Catalytic hydrotreating
1. Pretreating cat reformer feeds
2. Naphtha desulfurizing
3. Naphtha olefin or aromatics saturation
4. Straight-run distillate
5. Other distillates
6. Lube oil "polishing"
7. Other

Alkylation
1. Sulfuric acid
2. Hydrofluoric acid

Aromatics/Isomerization
1. BTX
2. Hydrodealkylation
3. Cyclohexane
4. C_4 feed
5. C_5 feed
6. C_5 and C_6 feed

Hydrogen
1. Steam methane reforming
2. Steam naphtha reforming
3. Partial oxidation
4. Cryogenic
5. Other

Calendar-day figures reported in this survey are the average volume a refinery unit processes each day including downtime used for turnarounds. This is actual total volume for the year divided by 365. (Stream day figures represent the amount a unit can process when running full capacity for short periods.)

INACTIVE REFINERIES

Australia
1. Maranoa Oil & Refining Co., Roma, Queensland, 510 b/cd.

Belgium
2. Belgian Shell NV, Ghent, 8,600 b/cd.

Canada
3. Gulf Canada Products Co., Montreal, 74,000 b/cd.

France
4. Mobil Oil Francaise, Frontignan, 82,000 b/cd.

Germany
5. Deutsche Shell AG, Monheim, 8,000 b/cd.
6. Gewerkschaft Erdol Raffinerie Deurag Nerag, Misburg, 45,000 b/cd.

Japan
7. Asia Oil CL, Hakodate, 22,500 b/cd.

United Kingdom
8. Shell U.K. Ltd., Ardrossan, Scotland, 5,000 b/cd.

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd							Production capacity, b/cd					Coke, tons/ day
			Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	
ABU DHABI	Abu Dhabi National Oil Co.–Ruwais	114,000	43,700	....	....	^{2}17,235	^{1}24,300	....	^{2}30,915 ^{7}18,702 ^{7}19,665	....	....	....	....	....	....
	Umm Al-Nar 1	14,250	....	....	....	^{4}2,520	....	....	^{2}4,770	....	....	....	....	....	....
	Umm Al-Nar 2	57,000	....	....	....	^{2}9,814	....	....	^{2}15,777 ^{7}5,309	....	....	....	....	....	....
	Total	**185,250**	**43,700**	....	....	**29,569**	**24,300**	....	**95,138**	....	....	....	....	....	....
ALBANIA	Government-owned refineries at Ballsh, Cerrik, Stalin.														
	Total	**40,000**													
ALGERIA	Sonatrach: Arzew	60,000	6,000	...	....	8,600	....	....	8,600	....	....	2,400	2,400	....	....
	Hassi Messaoud	23,700	....	....	....	2,000	....	....	....	....	....	....	....	....	....
	Maison Carree	58,000	....	....	....	15,000	....	....	15,000	....	....	....	....	....	....
	Skikda	323,000	9,000	....	....	30,000	....	....	....	....	1,900	....	2,900	....	....
	Total	**464,700**	**15,000**	....	....	**55,600**	....	....	**23,600**	....	**1,900**	**2,400**	**5,300**	....	....
ANGOLA	Petrangol SARL–Luanda	**32,100**	**1,900**	....	....	^{1}**1,900**	....	^{4}**2,800**	$^{1\text{-}2}$**3,800**	....	....	....	**950**	....	....
ARGENTINA	Destileria Argentina de Petróleo SA–Lomas de Zamora	2,000	1,500	....	....	....	....	....	....	....	....	....	....	....	....
	Esso SAPA–Campana	94,400	49,800	^{5}18,900	^{1}24,850	^{1}8,300	....	....	^{1}8,300	....	....	1,000	....	...	900
	Galvan	17,800	....	^{2}6,900	....	....	....	....	....	....	....	....	....	....	....
	Isaura SA–Bahia Blanca	12,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Shell Cia. Argentina de Petróleo SA–Buenos Aires	102,000	....	^{2}27,000	20,000	9,500	....	....	25,000	....	....	....	....	....	....
	Yacimientos Petroliferos Fiscales–														
	Campo Duran	32,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Dock Sud	4,000	1,000	....	....	....	....	....	....	....	....	....	....	....	....
	La Plata	216,000	69,500	^{5}22,000	^{1}45,000	^{1}9,000	....	....	^{1}9,000 ^{4}3,000 ^{6}5,900	^{1}1,200 ^{2}750 *2,700	....	4,150	17,600	....	....
	Lujan de Cuyo	129,000	66,000	^{5}30,000	^{1}20,900	^{1}9,000	^{1}23,900	....	^{1}4,400	....	....	....	....	^{1}19.0	....
	Plaza Huincul	23,000	....	....	....	^{2}2,500	....	....	^{2}2,500	....	....	....	....	....	....
	San Lorenzo	37,600	16,100	^{2}3,500 ^{3}12,500	....	....	....	....	....	....	....	....	....	....	....
	Total	**669,800**	**203,900**	**120,800**	**110,750**	**38,300**	**23,900**	....	**58,100**	**4,650**	....	**5,150**	**17,600**	**19.0**	**900**
AUSTRALIA	Ampol Refineries Ltd.–Lytton	65,000	25,000	....	^{1}26,000	^{1}12,600	....	....	....	^{2}4,000 *1,000	^{6}5,600	....	....	....	....
	Australian Lubricating Oil Refinery Ltd.–Kurnell	....	6,900	....	....	....	....	....	^{6}6,300	....	....	3,400	....	....	....
	BP Australia–Brisbane	42,000	11,400	....	^{1}12,800	^{2}8,500	....	....	^{4}7,600	^{2}1,700	....	....	1,500	....	....
	Kwinana	100,000	43,000	....	^{1}24,000	^{1}6,400 ^{2}16,400	....	^{4}8,200	^{1}12,000	^{2}2,400	....	2,600	1,700	....	....
	Caltex Refining CPL–Kurnell[1]	100,000	20,000	....	^{1}39,000	^{1}25,600	....	....	^{1}25,600 $^{4\text{-}5}$14,000	^{1}2,600 *2,700	....	....	3,000	....	....
	Mobil Oil Australia Ltd.–Adelaide	....	20,000	....	....	....	....	....	....	....	....	4,700	....	....	....

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity, b/cd Alky. *Poly.	Aromatics/ Isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
	Petroleum Refineries Australia PL–Adelaide	46,500	....	....	....	^{2}16,000	....	....	^{7}35,000	....	....	....	1,200	....	....
	Altona	98,600	22,000	....	^{2}24,000	^{2}28,000	....	....	^{1}35,000 ^{4}10,000	^{1}2,700	....	....	3,000	....	....
	Shell Refining (Australia) PL.–Clyde	64,000	....	....	31,000	13,300	....	7,000	37,000	....	....	....	....	....	....
	Geelong	110,000	....	....	^{1}25,000	27,800	....	11,000	55,000	....	....	....	....	....	....
	Total	**626,100**	**148,300**	....	**181,800**	**154,600**	....	**26,200**	**237,500**	**17,100**	**5,600**	**10,700**	**10,400**	....	....
	Solvent extraction: ^{1}4,800 b/cd.														
AUSTRIA	OeMV–Schwechat	204,000	68,000	^{3}17,000	^{1}24,000	^{2}14,000 ^{4}17,000	....	^{2}35,000 ^{4}33,000	^{1}37,000 ^{6}1,300 ^{7}11,000	....	^{6}9,500	2,300	5,850	....	....
	Total	**204,000**	**68,000**	**17,000**	**24,000**	**31,000**	....	**68,000**	**49,300**	....	**9,500**	**2,300**	**5,850**	....	....
BAHRAIN	Bahrain Petroleum Co. BSC (Closed)–Sitra	250,000	144,000	^{3}19,000	^{1}36,000	^{2}17,100	....	^{2}45,000	^{1}17,100 ^{4}18,000	*1,300	....	....	4,500	^{1}26.2	....
	Total	**250,000**	**144,000**	**19,000**	**36,000**	**17,100**	....	**45,000**	**35,100**	**1,300**	....	....	**4,500**	**26.2**	....
BANGLADESH	Eastern Refinery Ltd.–Chittagong	**31,200**	**3,530**	....	....	**^{1}1,650**	....	**^{3}2,430**	**^{1}1,940**	....	....	....	**1,200**	....	....
BARBADOS	Mobil Oil Barbados Ltd.–Bridgetown	**3,000**	....	....	....	....	....	....	....	....	....	....	....	....	....
BELGIUM	Belgian Refining Corp. NV–Antwerp	108,500	45,000	^{3}23,000	....	^{2}12,000	....	^{5}12,000	$^{1\text{-}2}$22,500 ^{5}25,000	....	....	....	....	....	....
	Esso Belgium–Antwerp	218,000	108,300	....	^{1}25,500	^{4}38,100	....	^{2}79,200	^{2}44,400 ^{4}71,200	....	....	....	2,000	^{1}46.0	....
	Nynas Petroleum NV—Antwerp	15,000	12,500	....	....	....	....	....	....	....	....	....	12,000	....	....
	SIBP NV–Antwerp	306,000	132,300	^{3}42,500	^{1}76,500	^{2}30,200	....	^{4}63,400	$^{1\text{-}3}$67,100	^{2}6,150 *1,560	....	....	11,300	....	....
	Total	**647,500**	**298,100**	**65,500**	**102,000**	**80,300**	....	**154,600**	**230,200**	**7,710**	....	....	**25,300**	**46.0**	....
BOLIVIA	Yacimientos Petroliferos Fiscales Bolivianos–Cochabamba^{1}	27,500	2,100	....	....	^{1}7,758	....	....	^{1}7,758 ^{6}455	....	....	500	54	....	....
	Santa Cruz	16,430	....	....	....	^{1}6,400	....	....	^{1}6,400	....	....	....	....	....	....
	Sucre	3,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Total	**46,930**	**2,100**	....	....	**14,158**	....	....	**14,613**	....	....	**500**	**54**	....	....
	^{1}Solvent extraction: 166 b/cd.														
BRAZIL	Petróleo Brasileiro SA: Araucária, Paraná^{1}	144,800	69,400	....	^{1}45,500	....	....	....	....	....	....	....	7,600	....	....
	Betim, Minas Gerais	120,600	58,300	....	^{1}30,400	....	....	....	^{2}10,200 ^{5}25,000	....	....	....	1,000	^{2}5.0	....
	Canoas, Rio Grande do Sul	63,300	35,000	....	^{1}13,600	....	....	....	....	....	....	....	....	....	....
	Cubatão, São Paulo	159,900	77,800	^{5}28,700 ^{6}3,700	^{1}48,300	^{1}10,200	....	....	....	....	....	....	....	....	1,265

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Production capacity, b/cd Alky. *Poly.	Aromatics/isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/day
	Duque de Caxias, Rio de Janeiro[2]	204,700	110,000	....	[1]46,300	[1]11,400	....	....	[6]12,900 [7]800	....	....	12,500	4,300	[1]5.0	....
	Fortaleza, Ceará	4,200	4,200	....	....	....	....	....	....	....	....	....	2,500	....	....
	Manaus, Amazonas	8,400	4,300	....	[1]1,800	....	....	....	....	....	....	....	400	....	....
	Mataripe, Bahia[3]	122,400	58,800	....	[1]25,000	....	....	....	[6]3,400 [7]2,500	....	....	3,500	1,700	[1]1.1	....
	Mauá, Santo André, São Paulo	27,200	7,700	....	[2]14,400	....	....	....	....	*3,300	....	....	....	....	....
	Paulínia, São Paulo	289,500	177,300	....	[1]39,800	....	....	....	....	....	....	....	....	....	....
	São José dos Campos, São Paulo	156,800	78,300	....	[1]54,300	....	....	....	[2]18,200 [4]59,700	....	....	....	7,500	[2]9.0	....
	Refinaria de Petróleo Ipiranga SA–Rio Grande do Sul	9,300	4,100	....	[1]2,500	....	....	....	....	....	....	....	4,984	....	....
	Refinaría de Petroleos de Manguinhos SA–Rio de Janeiro	10,000	....	[2]4,300 [3]4,400	....	....	....	....	....	....	....	....	....	....	....
	Total	**1,321,100**	**685,200**	**41,100**	**321,900**	**21,600**	....	....	**132,700**	**3,300**	....	**16,000**	**29,984**	**20.1**	**1,265**
	Solvent extraction: [1]28,400 b/d. [2]30,200 b/d (13,100 b/d for lubes). [3]3,400 (for lubes).														
BRUNEI	Brunei Shell Petroleum CL–Seria	**10,000**	....	....	....	....	....	....	....	....	....	....	....	....	....
BULGARIA	Government-owned refineries at Burgas, Pleven, Ruse.														
	Total	**300,000**													
BURMA	Petrochemical Industries Corp.–Chauk	6,300	2,500	....	....	....	....	....	....	....	....	....	....	....	....
	Syriam	20,000	2,300	[2]1,700	....	....	....	....	....	....	....	....	....	....	40
	Total	**26,300**	**4,800**	**1,700**	....	....	....	....	....	....	....	....	....	....	**40**
CAMEROON	Sonara–National Refining CL–Cape Limboh, Limbe	**43,000**	....	....	....	**[2]6,500**	....	**[4]10,000**	**[1]10,000**	....	....	....	....	....	....
CANADA **Alberta**	Husky Oil Operations Ltd.–Lloydminster	23,500	15,000	....	....	....	....	....	....	....	....	....	12,000	....	....
	Imperial Oil Ltd.–Edmonton	165,200	64,000	....	[1]47,000	[4]20,900	....	[4]14,300	[2]51,000	[2]12,700	[4]6,200	3,300	5,800	....	....
	Petro-Canada Products Inc.–Edmonton	121,100	27,000	[5]7,100	[1]36,000	[2]12,600	[4]18,200	....	[5]7,300 [7]46,600	[2]9,900	[4]3,000	....	....	[1]30.8	431
	Shell Canada Ltd.–Bowden	5,000	....	....	....	[2]2,300	....	....	[1]2,400	....	....	....	....	....	....
	Scotford	50,000	....	....	....	[6]18,500	[1]31,500	....	[1]18,500 [4]17,500	....	[1]9,900 [2]5,400 [3]300	....	....	[1]50.0	....
	Turbo Resources Ltd.–Balzac	27,500	6,950	....	[1]8,800	[2]7,550	....	....	[1]7,550 [4]7,550 [7]15,300	*1,035	....	....	....	....	....
	Total	**392,300**	**112,950**	**7,100**	**91,800**	**61,850**	**49,700**	**14,300**	**173,700**	**23,635**	**24,800**	**3,300**	**17,800**	**80.8**	**431**
British Columbia	Chevron Canada Ltd.–North Burnaby	35,000	11,200	....	[1]10,000	[2]10,500	....	....	[1]10,500	*650	....	....	2,200	....	....
	Husky Oil Operations Ltd.–Prince George	9,500	3,800	....	[1]3,300	[2]1,400	....	....	[7]6,900	....	....	....	1,300	....	....
	Imperial Oil Ltd.–Ioco	40,900	20,900	....	[1]12,400	[3]6,700	....	....	[2]6,600 [4]5,700 [5]5,700	*1,200	....	....	600	....	....

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd							Production capacity, b/cd					Coke, tons/day
			Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alky. *Poly.	Aromatics/ Isomerization	Lubes	Asphalt	Hydrogen, MMcfd	
	Petro-Canada Products Inc.– Port Moody	37,200	11,200	....	[1]12,300	[2]8,600	....	....	[1]15,400 [4]14,100	[1]1,400	....	....	....	....	....
	Taylor	17,700	1,600	....	[1]6,300	[2]3,000	....	....	[2]4,000 [4]7,200	[2]1,000	....	....	500	....	....
	Shell Canada Ltd.–Shellburn, Burnaby	24,000	6,700	....	[1]5,400	[6]2,400	....	....	[2]5,400 [5]9,900	*1,000	....	....	2,300	....	....
	Total	**164,300**	**55,400**	....	**49,700**	**32,600**	....	....	**91,400**	**5,250**	....	....	**6,900**	....	....
New Brunswick	Irving Oil Ltd.–St. John	237,500	61,750	[3]18,000	[1]17,100	[2]34,650	[1]29,700	....	[1]45,450 [4]40,500	*1,710	....	....	11,700	[2]40.0	....
	Total	**237,500**	**61,750**	**18,000**	**17,100**	**34,650**	**29,700**	....	**85,950**	**1,710**	....	....	**11,700**	**40.0**	....
Northwest Territories	Imperial Oil Ltd.–Norman Wells	**2,900**	....	....	....	....	....	....	....	....	....	....	....	....	....
Nova Scotia	Imperial Oil Ltd.–Dartmouth	82,300	39,800	....	[1]22,600	[4]8,600	....	....	[1]8,600 [4]25,700 [5]8,600	*2,600	....	....	3,700	[1]1.7	....
	Texaco Canada Ltd.–Halifax	20,000	8,600	....	[1]7,200	[2]3,600	....	[4]5,200	[1]3,600	....	....	....	....	....	....
	Total	**102,300**	**48,400**	....	**29,800**	**12,200**	....	**5,200**	**46,500**	**2,600**	....	....	**3,700**	**1.7**	....
Ontario	Imperial Oil Ltd.–Sarnia	123,500	28,500	[4]15,300	[1]23,000	[2]16,400 [4]13,300	[1]8,900	....	[2]32,300 [4]13,300 [5]24,700	[2]6,800 *3,000	....	6,000	....	[1]18.5	....
	Petro-Canada Products Inc.–Clarkson[1]	60,000	35,500	....	....	[6]9,800	[3]10,300	....	[1]10,300 [4]7,800	....	....	4,600	4,600	[1]13.3	....
	Oakville	80,500	41,000	....	[1]25,400	[1]5,000 [2]11,500	....	....	[1]19,500 [4]6,300	[1]3,100	....	....	9,500	....	....
	Shell Canada Ltd.–Sarnia	71,000	24,700	[3]3,100	[1]14,400	[2]11,200 [4]10,800	[1]6,700	....	[1]15,000 [5]6,300 [7]2,800	*1,000	[1]3,500 [2]500	....	....	....	....
	Suncor Inc.–Sarnia	70,000	15,000	[3]5,200	....	[2]26,000	[2]18,600	[4]3,700	[1]25,600	[2]4,100	[1]7,400	....	....	[1]38.0	....
	Texaco Canada Ltd.–Nanticoke	95,000	31,000	....	[1]40,000	[6]24,000	....	....	[1]24,000	[1]7,400	....	....	....	....	....
	Total	**500,000**	**175,700**	**23,600**	**102,800**	**128,000**	**44,500**	**3,700**	**187,900**	**25,400**	**11,400**	**10,600**	**14,100**	**69.8**	....
Quebec	Petro-Canada Products Inc.–Montreal	87,100	40,700	[3]13,000	[1]14,900	[2]31,500	[4]15,200	....	[1]26,700 [4]8,900	[1]2,200 *800	[1]8,700 [2]2,400	....	14,200	[1]45.0	....
	Shell Canada Ltd.–Montreal	120,000	49,400	[2]8,100	[1]21,200	[2]20,700	[1]11,700	....	[2]27,900 [4]32,400	[2]1,400	....	3,000	7,200	[1]15.0	....
	Ultramar Canada Inc.–St. Romuald	100,000	33,000	....	[1]30,000	[2]14,600	....	....	[1]14,600	*2,650	....	....	29,500	....	....
	Total	**307,100**	**123,100**	**21,100**	**66,100**	**66,800**	**26,900**	....	**110,500**	**7,050**	**11,100**	**3,000**	**50,900**	**60.0**	....
Saskatchewan	Consumers' Cooperative Refineries Ltd.–Regina	40,000	18,000	[5]6,300	[1]12,600	[1]9,000	....	....	[1]9,000	*4,400	....	....	....	....	360

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[1] Solvent extraction: 4,600 b/cd.

			Charge capacity, b/cd							Production capacity, b/cd					
WORLDWIDE REFINING	Company and refinery location	Crude	Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
	Petro-Canada Products Inc.– Moose Jaw	13,300	7,300	....	....	....	....	....	....	....	....	5,500	....	....	....
	Total	**53,300**	**25,300**	**6,300**	**13,000**	**9,000**	....	....	**9,000**	**4,400**	....	**5,500**	....	....	**360**
	Total Canada	**1,759,700**	**602,600**	**76,100**	**370,300**	**345,100**	**150,800**	**23,200**	**704,950**	**70,045**	**47,300**	**22,400**	**105,100**	**252.3**	**791**
CHILE	Enap–Gregorio, Magallanes	9,450	....	....	....	....	....	....	....	....	....	....	....	....	....
	Petrox SA–Concepción	72,000	40,000	[3]8,400	[1]20,000	....	....	....	....	....	....	....	....	....	....
	Refinería de Concón–Concón	69,000	34,000	....	[1]14,000	[1]5,300	....	....	....	[1]1,000	....	....	....	....	....
	Total	**150,450**	**74,000**	**8,400**	**34,000**	**5,300**	....	....	....	**1,000**	....	....	....	....	....
CHINA	Government-owned refineries at Anshan, Beijing, Dalian, Daqing, Fushun, Hangzhou, Jinxi, Karamai-Dushanzi, Lanchow, Lenghu, Maoming, Nanchong, Nanjing, Shanghai, Shengli, Tianjin, Yumen.														
	Total	**2,200,000**													
CHINA, TAIWAN	Chinese Petroleum Corp.–Kaohsiung	425,000	79,100	[4]3,933 [5]13,560	[1]22,600	[2]18,080 [6]18,080	[1]18,080	[1]27,120 [2]27,120 [3]22,600 [4]13,560	[1]36,000 [2]5,400 [5]18,080 [7]7,230	[2]3,200	[4]12,534 [5]1,202 [6]1,202	3,960	1,500	[2]50.0 [3]45.0	1,050
	Tao-Yuan	117,500	32,600	....	....	[2]15,800	....	[1]27,120 [2]18,080	[1]15,800 [4]14,500	....	....	....	....	[1]45.0	....
	Total	**542,500**	**111,700**	**17,493**	**22,600**	**51,960**	**18,080**	**135,600**	**97,010**	**3,200**	**14,938**	**3,960**	**1,500**	**140.0**	**1,050**
COLOMBIA	Empresa Colombiana de Petróleos –Barrancabermeja-Santander	150,000	80,000	[3]41,000	[1]62,000	[2]6,000	....	....	[1]22,000 [3]6,000 [6]4,300 [7]1,400	[1]3,000 [2]330 *1,150	[1]3,300 [2]1,100 [3]460	2,660	2,500	[1]15.8	....
	Cartagena, Bolivar	70,000	40,000	[3]20,000	[1]29,000	....	....	....	....	*5,800	....	....	....	....	....
	Orito, Putumayo	1,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Tibu, N. de Santander	5,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Total	**226,000**	**120,000**	**61,000**	**91,000**	**6,000**	....	....	**33,700**	**10,280**	**4,860**	**2,660**	**2,500**	**15.8**	....
CONGO	Coraf–Pointe-Noire	**21,000**	....	....	....	**[2]2,000**	**[1]2,000**	....	**[4]3,500**	....	....	....	....	....	....
COSTA RICA	Refinadora Costarricense de Petroleo SA–Limón	15,600	600	[2]6,500	....	[2]1,200	....	....	[1]1,200 [4]2,200	....	....	....	....	....	....
	Total	**15,600**	**600**	**6,500**	....	**1,200**	....	....	**3,400**	....	....	....	....	....	....
CUBA	Government-owned refineries at Cabaiguan, Havana, Santiago de Cuba.														
	Total	**160,000**													
CYPRUS	Cyprus Petroleum Refinery Ltd.– Larnaca	**16,000**	**1,800**	....	....	**[4]3,400**	....	....	**[4]6,000**	....	....	....	**700**	....	....
CZECHO-SLOVAKIA	Government owned refineries at Bratislava, Koiin, Kralupi, Pardubice, Strazke, Zaluzi, Zyolen.														
	Total	**455,000**													

			Charge capacity, b/cd							Production capacity, b/cd					
WORLDWIDE REFINING	**Company and refinery location**	**Crude**	**Vacuum distillation**	**Thermal operations**	**Catalytic cracking**	**Cat reforming**	**Cat hydrocracking**	**Cat hydrorefining**	**Cat hydrotreating**	**Alky. *Poly.**	**Aromatics/ Isomerization**	**Lubes**	**Asphalt**	**Hydrogen, MMcfd**	**Coke, tons/ day**
DENMARK	AS Dansk Shell–Fredericia	49,000	....	[2]23,000	....	11,000	....	10,000	15,000	....	....	....	....	....	....
	Dansk Statoil AS–Kalundborg	65,000	22,000	[3]26,000	....	[2]8,600	....	....	[1]8,600 [5]11,400	....	....	....	8,000	....	....
	Kuwait Petroleum Refining (Danmark) A/S–Skaelskor	52,000	....	[2]3,200 [3]18,600	....	[2]10,300	....	....	[2]13,800 [4]6,200 [5]6,900	....	....	....	....	....	....
	Total	**166,000**	**22,000**	**72,000**	....	**29,900**	....	**10,000**	**61,900**	....	....	....	**8,000**	....	....
DOMINICAN REPUBLIC	Falconbridge Dominicana C por A–La Peguera	16,000	....	....	....	....	....	....	[2]6,200	....	....	....	....	[2]0.4	....
	Refineria Dominicana de Petróleo SA–Haina	28,000	....	....	....	8,300	....	....	14,000	....	....	....	....	....	....
	Total	**44,000**	....	....	....	**8,300**	....	....	**20,200**	....	....	....	....	**0.4**	....
ECUADOR	CEPE–Esmeraldas	55,600	28,520	[3]12,600	[1]12,600	[2]2,780	....	....	[1]2,780	....	....	....	1,240	....	....
	Anglo Ecuadorian Oilfields Ltd.–Sta. Elena Peninsula	31,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Texaco–Lago-Agrio	1,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Total	**87,600**	**28,520**	**12,600**	**12,600**	**2,780**	....	....	**2,780**	....	....	....	**1,240**	....	....
EGYPT	Alexandria Petroleum Co.–Alexandria (El-Mex)	99,250	22,500	....	....	....	....	....	[6]1,436 [7]76	....	603 281	1,436	2,010	[1]1.0	1
	Cairo Oil Refining Co.–Mostorod	125,060	....	....	....	[2]9,000	....	....	[1]11,700 [4]14,400	....	....	....	....	....	....
	Tanta	21,800	....	....	....	....	....	....	....	....	....	....	....	....	....
	El Ameria Oil Refining Co.–Alexandria	60,340	14,725	....	....	[2]9,400	....	....	[1]12,000 [4]14,400 [6]1,608	[2]804	[1]86 [1]482	1,407	2,010	[1]1.0	....
	El-Nasr Petroleum Co.–El-Suez	73,450	....	....	....	....	....	....	....	....	....	....	2,613	....	....
	Wadi-Feran	9,680	....	....	....	....	....	....	....	....	....	....	....	....	....
	Suez Oil Processing Co.–El-Suez	62,530	9,500	[5]16,470	....	[2]12,540	....	....	[1]16,660 [4]10,800 [6]1,306	....	....	1,005	....	[8]3.5	540
	Total	**452,110**	**46,725**	**16,470**	....	**30,940**	....	....	**84,386**	**804**	**1,452**	**3,848**	**6,633**	**5.5**	**541**
El SALVADOR	Refineria Petrólera Acajutla SA–Acajutla	17,000	1,900	....	....	[1]3,000	....	....	[2]5,600 [4]6,500	....	....	....	600	....	....
	Total	**17,000**	**1,900**	....	....	**3,000**	....	....	**12,100**	....	....	....	**600**	....	....
ETHIOPIA	Ethiopian Petroleum Corp.–Assab	**18,000**	**1,600**	....	....	**[3]2,200**	....	....	**[1]4,100**	....	....	....	**570**	....	....
FINLAND	Neste Oy–Naantali	44,000	13,700	[3]7,100	[2]13,300	[5]6,800	....	[4]21,800	[2]6,600 [7]240	*280	....	....	3,000		....
	Porvoo	197,000	63,300	[3]39,200	[1]28,500	[1]19,800 [2]28,500	[1]14,200	[4]82,700	[2]66,200	*3,500	....	....	4,600	[1]20.0	....
	Total	**241,000**	**77,000**	**46,300**	**41,800**	**55,100**	**14,200**	**104,500**	**73,040**	**3,780**	....	....	**7,600**	**20.0**	....

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd							Production capacity, b/cd				Hydrogen, MMcfd	Coke, tons/day
			Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt		
FRANCE	Cie. de Raffinage et de Distribution Total France–Gonfreville L'Orcher[1]	309,000	73,000	[3]18,400	[1]30,100	[2]45,400	....	[2]60,400 [5]19,000	[2]71,600	*925	[1]1,500	7,400	20,250	....	....
	La Mède	136,000	47,500	25,000	[1]30,000	[2]23,400	....	[2]50,000 [5]15,000	....	[2]2,400	....	....	16,200	....	....
	Mardyck	122,000	40,000	....	[1]21,000	[2]20,500	....	[2]26,200	[2]37,500	....	....	....	....	....	....
	Cie. Rhénane de Raffinage–Reichstett-Vendenheim	86,000	....	[2]16,000	[1]11,000	12,000	....	12,000	19,000	....	....	....	....	....	....
	Elf France–Ambes	....	....	....	[1]6,800	....	....	....	....	....	....	....	....	....	....
	Donges	201,400	91,000	[3]26,200	[1]35,900	[2]27,300	....	....	[1]35,600 [4-5]44,200	[2]3,700	[6]4,300	....	....	....	....
	Feyzin	170,800	32,000	[3]14,200	[1]21,100	[2]8,400	....	....	[1]8,700 [4-5]28,900	....	[1]5,000	....	....	....	....
	Grandpuits	97,000	51,000	[3]12,800	[1]25,200	[2]13,300	...	....	[1]23,500 [4-5]29,400	[2]2,900	....	....	....	....	....
	Esso SAF–Fos sur Mer	68,000	13,000	....	....	[2]10,000	....	....	[1-2]18,000 [4-5]19,000	....	....	....	....	....	....
	Port Jerome	57,950	25,650	....	[1]7,200	[2]6,300	....	....	[1-2]14,000 [4]21,000	....	....	3,000	....	....	....
	Mobil Oil Francaise–Notre Dame de Gravenchon	57,000	35,500	....	....	[2]11,000	....	....	[1]13,000 [4]13,000	....	....	5,500	1,500	....	....
	Shell Francaise–Berre l'Etang	130,000	....	[2]22,000	19,000	15,000	....	32,000	32,000	....	....	....	....	....	....
	Petit Couronne	217,000	....	10,000	[1]19,000	41,000	....	31,000	62,000	....	....	....	....	....	....
	Ste. Francaise des Petroles BP–Dunkirk	....	18,000	....	....	....	....	....	....	....	....	4,200	....	....	....
	Lavera	181,900	....	[3]22,800	[1]26,000	[1]5,700	[1]13,500	[4]32,300	[5]14,000	....	[1]4,300	....	2,700	[1]28.0	....
	Total	**1,834,050**	**427,650**	**167,400**	**252,300**	**239,300**	**13,500**	**277,900**	**504,400**	**9,925**	**15,600**	**20,100**	**40,650**	**28.0**	....
GABON	Ste. Gabonaise de Raffinage–Port Gentil	**15,600**	....	**[3]7,200**	....	**[3]1,400**	....	....	**[4]4,500**	....	....	....	....	....	....
GERMANY, E.	Government-owned	**470,000**													
GERMANY, WEST	Deutsche BP-Erdol Ingolstadt–Vohburg†	102,000	35,300	....	[1]17,200	[1]17,200	....	[4]14,000	[4]28,000	....	....	....	5,500	....	....
	Deutsche Marathon Petroleum GmbH–Burghausen	70,000	....	[6]26,000	....	....	....	....	[5]18,000	....	[1]2,200	....	....	....	....
	Deutsche Shell AG–Godorf	170,000	....	[2]35,000	....	38,000	19,000	40,000	81,000	....	....	....	....	....	....
	Harburg-Grasbrook	86,000	....	[2]14,000	[1]15,000	15,000	....	12,000	30,000	....	....	....	....	....	....
	Deutsche Texaco AG–Heide	80,000	34,000	....	[2]9,000	[6]18,000	....	[4]29,000	[1]26,000	*300	....	....	3,500	....	....
	Elf Bitumenwerke GmbH–Brunsbuettel	....	7,500	....	....	....	....	....	....	....	....	....	....	....	....
	Erdol Raffinerie Duisburg GmbH–Duisburg	37,800	11,300	....	....	[2]7,300	....	[4]4,200	[1-2]7,300	....	....	....	....	....	....
	Erdoel Raffinerie Neustadt GmbH–Neustadt-Donau	144,000	65,400	[3]15,300	[1]22,700	[1]17,700	....	[4]27,200	[1]22,500	....	....	....	5,400	...	....
	Esso AG–Hamburg	90,000	18,000	....	[1]15,500	[2]12,800	...	....	[2]27,800 [5]33,500	....	....	....	6,900	....	....
	Ingolstadt	99,000	31,400	....	[1]19,800	[2]12,800	...	....	[2]19,700 [4]47,400	....	...	....	7,400	....	....
	Karlsruhe	150,000	46,700	[2]28,000 [3]23,000 [5]13,900 [6]1,900	....	[2]27,900	...	....	[2]43,000 [5]73,000	....	....	....	10,000	...	300

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[1]Solvent extraction: 9,800 b/cd.

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd: Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Production capacity, b/cd: Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
	Mobil Oil AG–Worth	75,000	23,000	....	[1]15,000	[2]14,000	....	....	[1]28,000 [5]19,000	....	....	....	5,000	....	....
	Oberrheinische Mineralolwerke GmbH–Karlsruhe	142,000	102,000	[3]26,000	[1]66,000	[4]11,400 [6]20,100	....	[3]45,900 [4]24,600	[1]37,400	[2]8,500	....	....	11,800	....	....
	Oelwerke Julius Schindler GmbH–Hamburg	....	10,000	....	....	....	....	....	[6]5,200	....	....	5,000	....	....	....
	Ruhr Oel GmbH–Gelsenkirchen	215,400	48,200	[3]16,000 [5]28,000	[1]6,000	[1]11,900 [5]27,000	[1]30,000	[4]63,000	[1]53,000	....	[1]10,620 [2]2,150 [3]2,420	....	4,840	[5]25.0	1,200
	Union Rheinische Braunkohlen Kraftstoff AG–Wesseling	95,000	71,000	[3]27,000	....	[4]14,000	[1]28,000	[4]16,000	[1]14,000 [2]16,000 [3]15,000	*2,500	[1]6,000	....	....	[1]32.0 [3]42.0 [4]17.0	....
	Wintershall AG–Lingen	91,400	28,900	[5]15,300	....	[1]7,400 [2]11,100 [4]15,000	[1]19,200	[4]21,300	[1]18,400 [2]2,500	....	[1]500 [2]900 [3]2,200	....	3,400	[1]40.0	420
	Mannheim	71,100	....	....	....	[2]18,400	....	[4]29,500	[1]18,400 [3]5,500	....	[1]2,650 [2]2,650 [5]2,800	....	....	....	....
	Salzbergen	5,100	4,600	....	....	....	....	....	[6]1,350	....	....	2,900	900	[1]0.5	....
	Total	**1,719,800**	**537,300**	**269,400**	**186,200**	**317,000**	**96,200**	**326,700**	**690,950**	**11,300**	**35,090**	**7,900**	**64,640**	**156.5**	**1,920**

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†Operating on a semi-integrated basis.

WORLDWIDE REFINING	Company and refinery location	Crude	Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
GHANA	Ghanaian Italian Petroleum CL–Tema	**28,000**	....	....	....	**[1]5,550**	....	....	....	....	....	....	....	....	....
GREECE	Hellenic Aspropyrgos Refinery SA–Aspropyrgos	110,000	4,300	....	....	[2]5,200 [2]9,500	....	[2]15,600	[2]22,300	....	....	....	....	....	....
	Motor Oil (Hellas) Corinth Refineries SA–Aghii Theodori	100,000	59,000	[2]19,520	[1]27,200	[1]8,500	....	....	[1]11,800 [5]25,800 [6]3,100	[2]2,400 *2,000	[6]4,250	3,100	2,800	....	....
	Petrola Hellas SA–Elefsis	108,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Thessaloniki Refining Co. AE–Thessaloniki	66,500	8,100	....	....	[2]8,100	....	....	[2]16,500 [4]18,800	....	....	....	2,800	....	....
	Total	**384,500**	**71,400**	**19,520**	**27,200**	**31,300**	....	**15,600**	**98,300**	**4,400**	**4,250**	**3,100**	**5,600**	....	....
GUATEMALA	Texas Petroleum Co.–Escuintla	16,000	....	....	....	[2]3,000	....	....	[1]3,000 [4]2,000	....	....	....	....	....	....
	Total	**16,000**	....	....	....	**3,000**	....	....	**5,000**	....	....	....	....	....	....
HONDURAS	Refineria Texas de Honduras SA–Puerto Cortes	14,000	....	....	....	[1]1,800	....	....	[1]3,000 [4]2,000	....	....	....	....	....	....
	Total	**14,000**	....	....	....	**1,800**	....	....	**5,000**	....	....	....	....	....	....

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd							Production capacity, b/cd					
			Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics/ Isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
HUNGARY	Dunai KV–Százhalombatta	165,000	77,500	....	20,000	^{4}26,000	....	....	^{1}26,000 ^{4}40,000 ^{6}2,500	....	^{1}6,200 ^{6}4,200	2,500	4,700	....	....
	Tiszai KV–Leninváros	66,500	33,000	....	....	....	....	....	^{4}16,400	....	....	....	....	....	....
	Zalai KV–Zalaegerszeg	10,000	6,000	....	....	....	....	....	....	....	....	....	4,900	....	....
	Total	**241,500**	**116,500**	....	**20,000**	**26,000**	....	....	**84,900**	....	**10,400**	**2,500**	**9,600**	....	....
INDIA	Bharat Petroleum CL–Mahul, Bombay	140,000	42,500	....	^{1}31,000	^{1}5,200	....	....	....	....	^{1}2,500 ^{2}375	....	10,000	....	....
	Bongaigaon Refinery & Petrochemicals Ltd.–Bongaigaon, Assam	21,400	....	^{5}10,400	....	^{1}1,930	....	....	^{1}1,930	....	....	....	....	....	185
	Cochin Refineries Ltd.–Kerala	90,000	34,270	^{3}22,830	^{1}19,100	^{5}5,660	....	....	^{2}11,690 ^{5}22,900	....	....	....	6,020	....	....
	Hindustan Petroleum CL–Mahul, Bombay[1]	120,000	55,000	....	^{1}9,000	....	^{3}6,500	....	....	....	....	6,500	11,000	....	....
	Visakhapatnam	89,820	37,437	....	^{1}18,938	....	....	....	....	....	....	....	2,610	....	....
	Indian Oil CL–Barauni	66,000	15,000	^{5}11,000	....	....	....	....	....	....	....	....	....	....	300
	Digboi	10,050	....	^{2}800	....	....	....	....	....	....	....	1,200	513	....	40
	Gauhati	16,400	....	^{5}5,500	....	....	....	....	....	....	....	....	....	....	150
	Gujarat	147,700	47,000	^{3}18,900	^{1}19,800	^{3}7,000	....	....	....	....	^{1}1,375	....	4,300	....	....
	Haldia	55,000	20,000	^{3}8,500	....	^{1}4,500	....	^{4}13,800	^{6}3,800	....	....	3,800	3,500	....	....
	Mathura	120,000	43,000	^{3}18,900	^{1}19,800	....	....	....	....	....	....	....	8,600	....	....
	Madras Refineries Ltd.–Madras	114,700	36,800	^{2}4,900 ^{3}3,000	^{1}11,770	^{1}2,400	....	....	^{1}2,400 ^{4}25,100 ^{6}4,000	....	....	4,000	3,800	^{1}9.5	....
	Total	**991,070**	**331,007**	**104,730**	**129,408**	**26,690**	**6,500**	**13,800**	**71,820**	....	**4,250**	**15,500**	**50,343**	**9.5**	**675**
INDONESIA	Lemigas–Cepu, Central Java	1,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Pertamina–Balikpapan, Kalimantan	230,500	84,100	....	....	^{6}18,000	^{2}49,500	....	^{3}18,000	....	....	....	....	^{5}66.6	....
	Cilacap, Central Java	270,000	29,300	^{3}50,000	....	^{3}29,100	....	^{2}15,400	^{3}18,100 ^{5}11,800 ^{7}23,200	....	....	5,000	7,500	....	....
	Dumai, Central Sumatra	90,000	83,500	^{5}31,500	....	^{1}13,600	^{2}50,400	....	^{3}9,100 ^{4}11,500	....	....	....	....	78.5	....
	Pangakalan Brandan, North Sumatra	3,600	....	....	....	....	....	....	....	....	....	....	1,200	....	....
	Sungai Pakning, Central Sumatra	40,700	....	....	....	....	....	....	....	....	....	....	....	....	....
	Total	**635,800**	**196,900**	**81,500**	....	**60,700**	**99,900**	**15,400**	**91,700**	....	....	**5,000**	**8,700**	**145.1**	....
IRAN	National Iranian Oil Co.–Esfahan	200,000	96,800	^{3}38,000	....	29,600	^{1}30,000	....	29,000	....	....	....	5,450	70.0	....
	Shiraz	40,000	18,400	^{3}8,800	....	6,245	^{1}9,380	3,120	5,225	....	....	....	....	....	....
	Tabriz	80,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Tehran	210,000	100,000	^{3}34,000	....	28,000	^{1}26,000 ^{2}27,800	....	....	....	....	6,000	7,000	....	....
	Total	**530,000**	**215,200**	**80,800**	....	**63,845**	**93,180**	**3,120**	**34,225**	....	....	**6,000**	**12,450**	**70.0**	....

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[1] Solvent extraction: 10,000 b/cd.

Note: Present status uncertain due to Iran-iraq war.

			Charge capacity, b/cd							Production capacity, b/cd				
WORLDWIDE REFINING	Company and refinery location	Crude	Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
IRAQ	Oil Refineries Administration–Baiji	150,000	65,000	....	....	22,000 16,500	38,000	31,000 28,000 41,000	....	....	....	....	....	64.0	....
	Basra	70,000	17,650	....	....	....	....	....	....	....	....	2,008	....	....	....
	Daura	71,000	....	....	....	5,000	....	....	13,000	....	....	8,160	1,815	....	....
	K3-Haditha	7,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Khanaqin	12,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Mufthia	4,500	....	....	....	....	....	....	....	....	....	....	....	....	....
	Qaiyarah, Mosul	2,000	...	....	....	....	....	....	....	....	....	....	4,900	....	....
	Iraqi Company for Oil Operations–Kirkuk	2,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Total	**318,500**	**82,650**	....	....	**43,500**	**38,000**	**100,000**	**13,000**	....	....	**10,168**	**6,715**	**64.0**	....
	Note: Present status uncertain due to Iran-Iraq war.														
IRELAND	Irish Refining Petroleum Corp. Ltd.–Whitegate	**56,000**	....	....	....	**[4]11,000**	....	**[4]5,500**	**[2]11,000**	....	....	....	....	....	....
ISRAEL	Oil Refineries Ltd.–Ashdod	70,000	35,000	[3]25,000	....	[2]10,000	....	[4]25,000	[1]15,000	....	....	....	....	....	....
	Haifa	110,000	55,000	[3]45,000	[1]20,000	[2]16,000	....	[4]20,000	[1]15,000	....	....	....	3,000	....	....
	Total	**180,000**	**90,000**	**70,000**	**20,000**	**26,000**	....	**45,000**	**30,000**	....	....	....	**3,000**	....	....
ITALY	ANIC SpA–Gela	80,000	32,000	[5]21,000	[1]32,000	[2]10,000	....	[4]25,000	[2]7,000	[2]9,000	[2]800 [4]4,000	....	....	....	1,050
	Anonima Petroli Italiana–Falconara, Marittima	83,000	13,000	[2]4,500 [3]34,000	....	[2]11,000	....	....	[1]20,000 [4]28,500	....	....	....	....	[5]3.8	....
	ERG SpA–Genoa, San Quirico	130,000	....	[3]38,500	....	[2]10,500	....	....	[1]10,500 [2]4,200 [4]29,000	....	....	....	....	....	....
	Esso Italiana SpA–Augusta, Siracusa	180,000	80,000	....	[1]39,300	[2]8,000 [4]6,600	....	....	[1]16,600 [4]25,800 [6]18,500	[2]7,200	[4]4,600	12,600	9,500	....	....
	Industrie Chimiche Italiane de Petrolio SpA–Frassino, Mantova	55,000	18,000	[2]9,000 [3]22,000	....	[2]9,500	....	....	[1]12,000 [4-5]15,000	....	[6]2,500	....	....	....	....
	Industria Italiana Petroli–Rho	79,800	29,900	....	[2]13,700	[2]16,000	....	[5]12,700	[7]21,600	[2]1,845	....	1,700	7,000	....	....
	Taranto	90,900	13,300	[6]40,900	....	[2]16,000	....	[4]12,100 [5]19,600	[7]23,400	....	....	....	2,500	[2]11.3	....
	Iplom SpA–Busalla	46,500	12,600	[3]13,100	....	....	....	....	....	....	....	6,500	5,000	....	....
	Irom–Industria Raffinazione Oli Minerali–Porto Marghera	85,000	11,000	[3]22,000	....	[2]16,000	....	[4]20,000	[2]11,000	....	[5]6,000	....	7,400	....	....
	Isab–Melilli	220,000	110,000	[2]15,000 [3]32,000	....	[4]34,500	[1]55,000	[4]54,000	[1]59,000	....	[6]15,000	....	....	[2]18.0	....
	Lombarda Petroli SpA–Villasanta	23,500	....	[6]630	....	[6]4,000	....	...	[1]4,800	....	....	....	....	....	....
	Mediterranea SpA–Milazzo	145,000	72,000	....	[1]36,000	[3]10,000	....	....	[1]10,000	[1]3,600	....	....	....	....	....
	Mobil Oil Italiana SpA–Naples	100,000	22,500	7,500	[2]18,400	[2]12,500	....	....	[1]12,500 [5]12,000	[2]3,500	....	....	650	....	....
	Raffineria del Po SpA–Sannazaro de Burgondi	230,000	64,000	....	[1]27,000	[2]10,500 [4]10,300	....	[4]37,000	[2]30,000	[2]3,600	[4]1,700	....	....	....	....
	Raffineria di Roma SpA–Rome	80,500	11,300	....	....	[2]14,200	....	[2]17,000	[2]19,900	....	[6]5,200	....	9,620	....	....
	Saras SpA–Sarroch	285,000	107,500	[3]27,000	[1]63,000	[6]27,000	....	....	[1]27,000 [4]60,000	[2]6,800	...	....	....	....	....

			Charge capacity, b/cd								Production capacity, b/cd				
WORLDWIDE REFINING	Company and refinery location	Crude	Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alky. *Poly.	Aromatics/ Isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
	Sarpom–Trecate, Novara	241,500	25,600	....	[1]16,600	[2]18,900 [4]8,300	....	[4]38,000	[2]69,700	*1,500	....	....	....	....	....
	Selm-Soc. Energia Montedison–Priolo	300,000	50,000	[3]25,000	[1]30,000	[2]9,000	....	[4]18,000	[1]9,000	....	[1]11,000 [2]1,300	....	....	....	....
	Soc. Petrolifera Italiana–Arcola, La Spezia	25,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Stanic–Livorno	98,000	36,000	....	....	[2]17,600	....	[4]31,700	[1]20,000	....	....	8,800	3,500	....	....
	Tamoil Italia SpA–Cremona	100,000	....	[3]33,000	....	[1]3,800 [2]6,400	....	[4]13,500	[2]14,400	....	[6]4,000	....	....	[5]5.5	....
	Total	**2,678,700**	**708,700**	**345,130**	**276,000**	**296,600**	**55,000**	**298,600**	**591,400**	**37,045**	**56,100**	**29,600**	**45,170**	**38.6**	**1,050**
IVORY COAST	Ste. Ivoirienne de Raffinage–Abidjan	63,000	34,000	....	....	[2]13,500	[1]14,000	....	[4]13,000	....	....	....	....	[1]5.2	....
	Ste. Multinationale de Bitumes–Abidjan	10,000	7,500	....	....	....	....	....	....	....	....	....	6,000	....	....
	Total	**73,000**	**41,500**	**....**	**....**	**13,500**	**14,000**	**....**	**13,000**	**....**	**....**	**....**	**6,000**	**5.2**	**....**
JAMAICA	Petrojam Ltd.–Kingston	35,500	2,000	....	....	[1]3,540	....	....	[2]6,400 [4]13,200	....	....	....	1,000	....	....
	Total	**35,500**	**2,000**	**....**	**....**	**3,540**	**....**	**....**	**19,600**	**....**	**....**	**....**	**1,000**	**....**	**....**
JAPAN	Asia Kyoseki CL–Sakaide, Kagawa	140,000	41,500	....	[1]17,000	[1]10,000	....	[1]28,000 [2]17,200 [4]37,000 [5]19,000	[1]10,000	....	....	....	....	[5]32.0	....
	Asia Oil CL–Yokohama, Kanagawa	80,000	....	....	....	[1]14,000	....	[1]32,000 [4]29,400	[1]14,000	....	....	....	....	[5]49.0	....
	Cosmo Oil CL–Chiba	209,000	57,000	....	[1]23,400	[2]22,500	....	[1]54,000 [2]31,500	[1]22,500 [2]7,200 [4]51,300	....	....	....	....	[1]21.0 [2]62.0	....
	Matsuyama	....	....	....	....	[2]4,500	....	....	[2]7,200 [3]9,900	....	[1]1,800	....	....	....	....
	Sakai	104,500	32,300	....	[1]17,550	[2]6,300	....	[2]18,000	[1]7,650 [4]20,700	....	....	....	....	[5]10.6	....
	Yokkaichi City	166,250	70,300	....	[1]22,500	[2]3,600 [4]9,900	....	[2]31,500	[1]14,400 [4]58,500 [6]5,850	....	....	5,850	6,210	[5]12.0	....
	Fuji Kosan Oil CL–Kainan	77,600	44,000	....	....	....	....	....	9,000	....	....	13,600	17,500	....	....
	Fuji Oil CL–Sodegaura	153,700	79,600	[6]19,000	[1]12,500	[2]13,600	....	[2]52,400	[1]27,000 [4]41,600 [7]6,800	....	....	....	....	[2]27.9	....
	General Sekiyu Seisei KK–Sakai	140,400	47,700	....	[1]32,500	[2]22,500	....	[3]27,900	[2]36,000 [4]54,300	....	[1]17,200	....	....	[2]21.4	....
	Kawasaki	....	....	....	....	3,600	....	....	7,650	....	....	....	....	....	....
	Idemitsu Kosan CL–Chita, Aichi	123,500	....	....	....	[4]16,200	....	[1]49,500	[1]23,400 [4]36,000	[1]3,700	....	....	....	[2]63.8 [4]13.2	....
	Himeji, Hyogo	104,500	....	....	....	[2]15,300	....	[1]36,000	[1]22,500 [4]27,000	....	....	....	....	[2]33.6	....
	Ichihara, Chiba	199,500	57,000	...	[1]37,800	[2]15,300	[3]9,450	[1]36,000 [3]35,100 [5]5,400	[1]38,700 [4]47,700	....	....	5,170	7,900	[2]64.9 [5]3.5	....
	Tokuyama, Yamaguchi	95,000	47,500	....	[1]20,700	[2]3,690	...	[3]40,500	[1]13,500 [4]31,500	....	....	....	1,530	[2]18.0	....
	Tomakomai, Hokkaido	85,500	19,000	....	....	[2]16,200	[1]13,500	....	[1]24,300 [4]22,860	....	....	....	....	[4]2.4	....

		Charge capacity, b/cd							Production capacity, b/cd					
Company and refinery location	Crude	Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
Kashima Oil CL–Kashima, Ibaragi	150,000	67,000	....	^{1}17,500	^{4}12,500	....	^{1}20,000 ^{2}25,000	^{1}14,500 ^{4}35,000	....	....	....	....	^{1}22.5	....
Koa Oil CL–Marifu	119,700	50,400	^{5}20,520	^{1}14,400	^{2}8,730	....	^{2}9,000	^{1}9,900 ^{4}15,300 ^{5}10,800	....	....	....	1,530	^{2}5.9	450
Osaka	72,000	49,500	....	^{1}16,200	^{2}8,100	....	^{2}13,500	^{1}9,900 ^{4}10,800	....	....	....	....	....	....
Kyokuto Petroleum Ltd.–Chiba	120,000	55,000	....	....	^{2}14,500	^{1}28,000	....	^{1}16,000 ^{4}20,000	....	....	....	....	^{2}20.0	....
Kyushu Oil CL–Oita	130,000	66,000	....	^{1}16,500	^{2}8,000	....	^{2}33,000 ^{4}27,000	^{1}9,000	....	....	....	....	^{5}14.9	....
Mitsubishi Oil CL–Kawasaki	75,000	5,800	....	....	^{2}15,000	....	^{4}29,500	^{1}18,500	....	....	....	1,100	....	....
Mizushima	220,000	97,000	....	^{1}30,000	^{2}30,100	....	^{1}45,000 ^{2}30,000 ^{3}30,000 ^{4}25,000	^{1}28,000 ^{3}14,000 ^{6}4,100	*880	^{1}11,700	2,800	6,400	^{2}60.0	....
Nansei Sekiyu KK–Nishihara, Okinawa	45,000	....	....	....	^{1}5,400	....	....	^{2}21,100 ^{4}13,500	....	....	....	....	....	....
Nichimo Sekiyu Seisei KK–Kawasaki	76,000	....	....	...	^{1}7,400	....	....	^{2}7,200 ^{4}21,600	....	....	....	....	....	....
Nihonkai Oil CL–Toyama	60,000	....	...	....	....	....	....	....	....	....	....	....	....	....
Nippon Mining CL–Chita	85,000	46,000	....	^{1}13,000	^{2}22,000	....	^{2}37,000	^{2}43,000 ^{4}46,000	....	^{1}4,600 ^{2}2,000 ^{3}1,300	....	....	^{1}25.0	....
Funakawa	6,000	2,740	....	....	....	....	....	....	....	....	1,070	....	....	....
Mizushima	190,200	101,000	....	^{1}38,000	^{6}20,000	....	^{1}31,000 ^{2}60,000	^{2}28,300 ^{4}49,100 ^{6}6,000	....	....	4,900	....	^{1}29.0 ^{2}30.0	....
Nippon Oil CL–Niigata	26,000	2,000	....	....	^{2}3,500	....	....	^{5}21,300	....	....	....	425	....	....
Nippon Petroleum Refining CL–Kudamatsu	22,000	4,500	....	....	^{2}1,300	....	....	^{2}5,700 ^{5}6,200	....	....	600	1,080	....	....
Muroran	150,000	50,000	....	^{1}19,000	^{2}19,000	....	^{1}25,000 ^{2}40,000	^{2}32,000 ^{5}48,000	....	....	....	4,160	^{5}62.0	....
Nakagusuku, Okinawa	8,000	....	....	....	^{2}2,000	....	....	^{2}2,000	....	....	....	....	....	....
Negishi	305,000	110,000	^{3}20,000	^{1}36,000	^{2}44,000	....	^{2}81,000	^{2}53,000 ^{5}69,000	....	....	4,310	6,550	^{5}22.0	....
Yokohama	55,000	25,000	....	....	^{2}1,800	....	....	^{1}3,300 ^{5}7,300	....	....	2,380	2,500	....	....
Okinawa Sekiyu Seisei–Yonashiro, Okinawa	57,000	....	....	....	....	....	^{1}34,200 ^{2}13,500	^{4}18,000	....	....	....	....	^{2}42.7	....
Seibu Sekiyu KK–Onoda	134,000	....	....	....	17,000	....	65,000	72,000	....	....	....	....	....	....
Showa Shell Sekiyu KK–Kawasaki	135,000	....	....	....	20,000	....	41,000	26,000	....	....	....	....	....	....
Niigata	30,000	....	....	....	4,400	....	2,000	12,000	....	....	....	....	....	....
Showa Yokkaichi Sekiyu KK–Yokkaichi	207,000	....	....	22,000	38,000	....	71,000	91,000	....	....	....	....	....	....
Taiyo Oil CL–Ehime	65,000	4,000	....	....	^{2}5,000	....	....	^{1}8,200 ^{4}12,000	....	....	....	....	....	....
Toa Nenryo Kogyo–Kawasaki	190,000	116,900	....	^{1}68,400	^{2}15,200	....	^{3}74,000	^{2}32,300 ^{4}31,400 ^{5}11,400	....	....	....	....	^{2}39.0	....
Shimizu	28,500	....	....	....	^{2}4,400	....	....	^{2}9,000 ^{4}9,500	....	....	....	....	....	....
Wakayama	162,500	74,200	....	^{1}27,800	^{2}34,200	....	^{2}23,800	^{2}33,700 ^{4}39,000 ^{5}20,900	^{1}1,400	....	6,100	....	^{1}16.0	....

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd							Production capacity, b/cd				Hydrogen, MMcfd	Coke, tons/day
			Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics/isomerization	Lubes	Asphalt		
	Toa Oil CL–Kawasaki	65,000	53,000	[6]21,000	....	[2]11,000	....	....	[1]17,000 [3]3,500 [4]22,000 [5]46,000	....	....	....	....	[5]34.7	150
	Toho Oil CL–Owase	40,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Tohoku Oil CL–Sendai	83,600	57,000	....	....	[2]11,700	....	[2]31,500	[1]11,700 [4]18,900	....	....	....	2,246	....	....
	Total	**4,790,050**	**1,532,940**	**80,520**	**502,750**	**561,420**	**50,950**	**1,497,400**	**1,943,910**	**5,980**	**38,600**	**46,780**	**59,241**	**859.0**	**600**
JORDAN	Jordan Petroleum Refinery–Zerka	100,000	16,900	...	[1]4,410	[2]8,640	[1]4,230	....	[1]11,860 [4]2,000	....	....	....	....	[2]7.9	....
	Total	**100,000**	**16,900**	....	**4,410**	**8,640**	**4,230**	....	**13,860**	....	....	....	....	**7.9**	....
KENYA	Kenya Petroleum Refineries Ltd.–Mombasa	**95,000**	....	....	....	**[2]9,000**	....	....	**[1-4]33,000**	....	....	....	....	....	....
KOREA, N.	Government-owned, Unggi	**42,000**													
KOREA, S.	Honam Oil Refinery CL–Yosu	355,000	....	[3]30,000	...	[2]15,300	....	....	[2]22,500	....	....	....	3,600	....	....
	Kukdong Oil CL–Busan[1]	10,000	7,000	....	....	....	....	....	[2]2,000 [6]1,200	....	....	2,000	4,000	[2]0.4	....
	Kyung In Energy CL–Inchon	60,000	....	....	...	[2]3,600	....	....	[1]3,600 [4]4,000	....	....	....	....	....	....
	Modern Petroleum CL–Busan	2,000	1,000	...	....	....	....	....	....	....	....	....	....	....	....
	Ssangyong Oil Refining CL–Onsan[2]	90,000	22,000	....	....	[1]4,000	[3]7,000	[4]21,000	[1]4,000 [2]1,100 [6]2,400	....	....	3,500	5,000	[2]14.0	....
	Yukong Ltd.–Ulsan	345,000	5,000	....	....	[2]20,300 [6]20,000	....	....	[1]42,200 [4]12,000	....	[1]13,800 [3]800	....	3,500	[5]3.0	....
	Total	**862,000**	**35,000**	**30,000**	....	**63,200**	**7,000**	**21,000**	**95,000**	....	**14,600**	**5,500**	**16,100**	**17.4**	....
	Solvent extraction: [1]2,100 b/d. [2]8,000 b/d.														
KUWAIT	Getty Oil Co. (subsidiary of Texaco Inc.)–Mina Al-Zour	60,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Kuwait National Petroleum Co.–Mina Abdulla	75,000	....	....	....	...	....	[1]35,000	....	....	....	....	....	[1]30.0	....
	Mina Al-Ahmadi	288,000	77,000	....	[1]30,000	[2]36,000	[1]38,000	[1]132,000 [2]55,000 [4]15,000	[1]36,000	....	....	....	....	[1]168.0 [5]89.4	....
	Shuaiba	195,000	140,000	...	..	[2]15,000	[1]67,000 [2]54,000	[4]70,000 [5]30,000	....	....	....	....	....	[1]220.0	....
	Total	**618,000**	**217,000**	....	**30,000**	**51,000**	**159,000**	**337,000**	**36,000**	....	....	....	....	**507.4**	....
LEBANON	Tripoli Oil Installations–Tripoli	20,000	12,730	....	[1]7,250	[2]4,392	....	[2]7,392	....	....	....	....	409	....	....
	Mediterranean Refining Co.–Sidon	17,000	....	...	....	[1]3,100	....	....	[1]3,100	....	....	....	....	....	....
	Total	**37,000**	**12,730**	....	**7,250**	**7,492**	....	**7,392**	**3,100**	....	....	....	**409**	....	....

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd							Production capacity, b/cd					
			Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
LIBERIA	Liberia Petroleum Refining–Monrovia	15,000	1,000	....	....	[1]2,000	....	....	[1]2,300 [4]1,000	....	....	....	200	....	....
	Total	**15,000**	**1,000**	....	....	**2,000**	....	....	**3,300**	....	....	....	**200**	....	....
LIBYA	Azzawiya Oil Refining Co.–Azzawiya	120,000	3,432	....	....	[2]12,982	....	....	16,908 [5]18,718	....	....	....	1,716		....
	Ras Lanuf Oil & Gas Processing Co.–Ras Lanuf	201,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Sirte Oil Co.–Brega	8,400	....	....	....	[1]1,600	....	....	[2]1,600	....	....	....	....	....	....
	Total	**329,400**	**3,432**	....	....	**14,582**	....	....	**37,226**	....	....	...	**1,716**	....	....
MADAGASCAR	Solima–Managareza, Tamatave	**16,350**	....	....	....	**[4]2,600**	....	....	**[1]5,500**	....	....	....	....	....	....
MALAYSIA	Esso Malaysia Berhad–Port Dickson	47,300	4,750	....	....	[2]7,410	....	....	[1]11,400 [4]13,600		....	....	....	....	....
	Petronas Penapisan Sdn. Berhad–Kerteh, Kemaman, Terengganu	30,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Sarawak Shell Berhad–Luton	45,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Shell Refining Co. Berhad–Port Dickson	90,000	....	....	....	14,000	....	5,000	28,000	....	....	....	....	....	....
	Total	**212,300**	**4,750**	....	....	**21,410**	....	**5,000**	**53,000**	....	....	....	....	....	....
MARTINIQUE	Ste. Anonyme de la Raffinerie des Antilles–Fort-de-France	12,800	....	....	....	[2]3,000	....	....	[1]4,850 [4]3,500	....	....	....	....	....	....
	Total	**12,800**	....	....	....	**3,000**	....	....	**8,350**	....	....	....	....	....	....
MEXICO	Petroleos Mexicanos–Azcapotzalco	105,000	48,000	[3]20,000	[1]24,000	....	....	....	[2]24,000	[2]3,700 *500	....	....	....	....	....
	Cadereyta	235,000	137,000	....	[1]40,000	[2]20,000	....	....	[1]36,000 [5]50,000	....	....	....	....	....	....
	Ciudad Madero	195,000	81,500	[3]8,000 [4]9,000	[1]43,000	[2]15,000	....	....	[1]15,000 [5]37,000	[2]3,700 *500	....	....	6,000	[3]10.0	1,287
	Minatitlan	200,000	83,000	....	[1]24,000 [2]16,000	[2]28,000	....	....	[1]64,000 [5]25,000	*600	[1]20,000 [2]1,500 [3]2,400	....	....	....	....
	Poza Rica	50,000	....	....	....	....	....	....	[2]5,000	....	....	....	....	....	....
	Reynosa	9,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Salamanca	235,000	101,200	[2]4,000	[1]40,000	[2]24,800	[2]18,000	....	[1]33,000 [5]36,000	....	....	11,000	3,000	[3]60.0	....
	Salina Cruz	165,000	75,000	....	[1]40,000	[4]20,000	....	....	[1]25,000 [5]50,000	....	....	....	....	....	....
	Tula, Hidalgo	155,000	75,000	[3]41,000	[1]40,000	[2]30,000	....	....	[1]36,000 [5]50,000	....	....	....	....	....	....
	Total	**1,349,000**	**600,700**	**82,000**	**267,000**	**137,800**	**18,000**	....	**486,000**	**9,000**	**23,900**	**11,000**	**9,000**	**70.0**	**1,287**
MOROCCO	Samir–Mohammedia	55,703	5,760	....	....	[4]10,935	....	....	[1]12,029 [4]7,613	....		1,514	....	....	....
	Ste. Cherifienne des Petroles–Sidi Kacem	25,600	7,400	....	[2]5,600	[1]2,800	....	....	....	....	....	....	....	....	....
	Total	**81,303**	**13,160**	....	**5,600**	**13,735**	....	....	**19,642**	....	....	**1,514**	....	....	....

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd							Production capacity, b/cd					
			Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
MOZAMBIQUE	Petromoc EE–Matola-Lingamo	**17,000**	**1,500**	....	....	**[3]2,500**	....	**[4]2,500**	....	....	....	....	**900**	....	....
NETHERLANDS	BP Raffinaderij Nederland NV–Rotterdam	437,000	73,000	[3]35,000	[1]47,500	[2]27,000	....	[4]33,200	[2]148,000	[2]4,700	....	....	....	....	....
	Esso Nederland BV–Rotterdam	175,800	66,500	[6]28,700	....	[4]25,200	....	....	[1]25,200 [2]9,900 [4]61,200 [5]13,500		....	....	....	[1]21.0	....
	Kuwait Petroleum Europoort BV–Europoort	75,000	32,870	[2]9,460 [3]6,550	....	[2]8,200	....	....	[2]12,120 [4]27,840 [6]6,060	....	....	4,700	8,500	....	....
	Shell Nederland Raffinaderij BV–Pernis	348,000	....	[2]45,000	[1]78,000	45,000	....	112,000	136,000	....	....	....	....	....	....
	Smid & Hollander Raffinaderij BV–Amsterdam	8,000	8,000	....	....	....	....	....	....	....	....	....	6,000	....	....
	Texaco Petroleum Mij. (Nederland) BV–Pernis	207,000	28,000	[3]24,000	....	[2]29,000	....	[4]38,000	[1]29,000	....	....	....	....	....	....
	Total Raffinaderij Nederland NV–Vlissingen	150,000	45,000	....	....	[2]16,000	[1]30,000	....	[1]18,000 [5]25,000	....	....	....	....	[1]65.0	....
	Total	**1,400,800**	**253,370**	**148,710**	**125,500**	**150,400**	**30,000**	**183,200**	**511,820**	**4,700**	....	**4,700**	**14,500**	**86.0**	....
NETHERLANDS ANTILLES	Refineria Isla Curazao SA–Emmastad	320,000	158,000	[3]67,000	[1]42,000	[2]15,000	....	....	[2]60,000 [4]34,000 [5]25,000 [6]2,500	[2]5,000 *600	....	8,000	8,000	....	....
	Total	**320,000**	**158,000**	**67,000**	**42,000**	**15,000**	....	....	**121,500**	**5,600**	....	**8,000**	**8,000**	....	....
NEW ZEALAND	New Zealand Refining–Whangarei	**54,000**	....	....	....	**26,000**	....	**6,800**	**40,000**	....	....	....	....	....	....
NICARAGUA	Esso Standard Oil SA Ltd –Managua	14,500	2,000	....	....	[1]2,800	....	....	[2]3,600 [7]4,800	....	....	....	800	....	....
	Total	**14,500**	**2,000**	....	....	**2,800**	....	....	**8,400**	....	....	....	**800**	....	....
NIGERIA	Nigerian Petroleum Refining CL–Kaduna	90,400	34,600	....	[1]18,100	[1]15,400		....	[1]21,700 [4]15,800 [7]530	....	....	4,900	14,100	....	....
	Port Harcourt, Alesa Eleme	60,000		....	....	[1]6,000	....	....	....	....	....	....	....	....	....
	Warri	100,000	32,000	.	[1]26,000	[2]16,700	....	....	[1]16,700 [5]8,600	....	....	....	....	....	....
	Total	**250,400**	**66,600**	....	**44,100**	**38,100**	....	....	**63,330**	....	....	**4,900**	**14,100**	....	....
NORWAY	Esso Norge AS–Slagen-Valloy	90,000	3,000	[2]12,500 [3]28,000		[2]9,150		[5]7,500	[1]17,500				2,000		....
	Norske Shell AS–Sola	60,000		[2]26,000		10,000		9,000	16,000						....
	Rafinor AS-Mongstad	90,000		[5]20,000		[2]10,000			[2]10,000 [5]16,000		[6]3,000				480
	Total	**240,000**	**3,000**	**86,500**	....	**29,150**	....	**16,500**	**59,500**	....	**3,000**	....	**2,000**	....	**480**

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd							Production capacity, b/cd					Coke, tons/day
			Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics/isomerization	Lubes	Asphalt	Hydrogen, MMcfd	
OMAN	Oman Refinery Co.–Mina Al Fahal	**48,082**	....	....	....	**[2]9,644**	....	....	**[1]12,425**	....	....	....	....	....	....
PAKISTAN	Attock Refinery Ltd.–Rawalpindi	36,000	1,000	....	....	....	....	....	....	....	....	115	100	....	....
	National Refinery Ltd.– Korangi, Karachi	47,750	13,200	....	....	[2]2,750	....	....	[1]2,800 [4]4,000	....	[1]1,250	3,700	3,950	[1]0.1	....
	Pakistan Refinery Ltd.–Karachi	46,250	....	....	....	[1]3,000	....	....	[7]21,000	....	....	....	....	....	....
	Total	**130,000**	**14,200**	....	....	**5,750**	....	....	**27,800**	....	**1,250**	**3,815**	**4,050**	**0.1**	....
PANAMA	Refinería Panama SA–Las Minas	100,000	14,000	....	....	[2]7,500	....	....	[1]10,000 [4]20,000	....	....	....	5,000	....	....
	Total	**100,000**	**14,000**	....	....	**7.500**	....	....	**30,000**	....	....	....	**5,000**	....	....
PARAGUAY	Petroleos Paraguayos–Villa Elisa	**7,500**	....	....	....	....	....	....	....	....	....	....	....	....	....
PERU	Petróleos del Peru:														
	Conchan	6,290	4,020	....	....	....	....	....	....	....	....	....	....	....	....
	Iquitos, Loreto	9,860	....	....	....	....	....	....	....	....	....	....	....	....	....
	La Pampilla, Lima	93,900	11,090	....	[1]6,230	[3]1,680	....	....	....	....	....	....	....	....	....
	Marsella, Loreto	2,040	....	....	....	....	....	....	....	....	....	....	....	....	....
	Pucallpa	2,440	....	....	....	....	....	....	....	....	....	....	....	....	....
	Talara	61,030	22,180	....	[1]15,440	....	....	....	....	....	....	1,080	1,530	....	....
	Total	**175,560**	**37,290**	....	**21,670**	**1,680**	....	....	....	....	....	**1,080**	**1,530**	....	....
PHILIPPINES	Bataan Refining Corp.–Limay	155,000	20,000	....	[2]15,000	[1]23,800	....	[5]18,000	[2]50,000	*4,400	....	....	5,000	....	....
	Caltex (Philippines) Inc.–Batangas	63,000	18,100	....	[1]8,100	[2]8,100	....	....	[1-2]10,800 [4]14,400	....	....	....	....	....	....
	Pilipinas Shell Petroleum–Tabangao	68,000	....	....	....	8,300	....	5,500	15,500	....	....	....	....	....	....
	Total	**286,000**	**38,100**	....	**23,100**	**40,200**	....	**23,500**	**90,700**	**4,400**	....	....	**5,000**	....	....
POLAND	Government-owned refineries at Czechowice, Gdansk, Glinik Mariampolski, Jasto, Jealicze, Kralaty, L. Warynski, Plock, Trzebinia. Of these, Plock is by far the largest, accounting for roughly 80% of Polish refinery production. Its crude capacity is nearly 300,000 b/d.														
	Total	**385,000**													
PORTUGAL	Petrogal–Lisbon	....	18,900	....	[2]10,100	....	....	[2]3,400	....	....	....	....	675	....	....
	Leça da Palmeira, Porto	88,300	11,000	....	....	[6]10,500	....	....	[1]12,200 [4]7,300 [6]2,939	....	[1]6,500	2,939	1,600	....	....
	Sines	206,000	23,300	....	....	[6]24,900	[1]9,400	[2]13,800 [4]28,800	[1]24,900	....	....	....	2,200	....	....
	Total	**294,300**	**53,200**	....	**10,100**	**35,400**	**9,400**	**46,000**	**47,339**	....	**6,500**	**2,939**	**4,475**	....	....
PUERTO RICO	Chevron Oil Co.–Bayamón	38,000	19,300	....	[1]12,000	[2]5,800	....	....	[2]5,900 [4]9,800	*1,000	....	....	900	....	....
	Yabucoa Sun Oil Co.–Yabucoa[1]	85,000	40,000	....	....	....	[3]15,000	[4]10,000	....	....	....	6,800	....	[2]17.0	....
	Total	**121,000**	**59,300**	....	**12,000**	**5,800**	**15,000**	**10,000**	**15,700**	**1,000**	....	**6,800**	**900**	**17.0**	....

Solvent extraction: [1]7,000

			Charge capacity, b/cd							Production capacity, b/cd					
WORLDWIDE REFINING	**Company and refinery location**	**Crude**	**Vacuum distillation**	**Thermal operations**	**Catalytic cracking**	**Cat reforming**	**Cat hydro-cracking**	**Cat hydro-refining**	**Cat hydro-treating**	**Alky. *Poly.**	**Aromatics/ isomerization**	**Lubes**	**Asphalt**	**Hydrogen, MMcfd**	**Coke, tons/ day**
QATAR	National Oil Distribution Co.– – Umm Said	62,000	....	....	....	^{5}12,200 ^{6}9,830	....	....	^{2}17,240 ^{4}10,500 ^{5}11,900	....	....	....	....	....	....
	Total	**62,000**	....	....	....	**22,030**	....	....	**39,640**	....	....	....	....	....	....
RUMANIA	Government-owned refineries at Bacau, Borzesti, Brazi, Brazov, Cimpina, Darmanesti, G. Gheorghiu Dej, Navodari, Onesti, Pitesti, Ploesti, Sulpacu, and Telaejen														
	Total	**617,000**													
SAUDI ARABIA	Arabian American Oil Co.– Ras Tanura	450,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Arabian Oil Co.–Ras Al Khafji	30,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Jeddah Oil Refinery–Jeddah	91,000	15,000	....	^{1}10,000	^{2}2,900	....	....	....	....	....	....	....	....	....
	Petromin-Shell–Al-Jubail[1]	250,000	....	26,000	....	15,000	37,000	39,000	113,000	....	....	....	12,700	^{1}64.0	....
	Riyadh Oil Refinery–Riyadh[2]	134,000	52,655	....	....	^{2}28,600 ^{5}5,400	^{2}31,100	....	^{2}30,900 ^{4}12,900	....	8,000	....	....	117.0	....
	Yanbu Domestic Refinery–Yanbu	170,000	....	....	....	^{1}35,000	....	....	^{1}35,000 ^{4}15,200	....	....	....	....	....	....
	Total	**1,125,000**	**67,655**	**26,000**	**10,000**	**86,900**	**68,100**	**39,000**	**207,000**	....	**8,000**	....	**12,700**	**181.0**	....
	Solvent extraction: [1]12,500 b/cd. [2]8,800 b/cd.														
SENEGAL	Ste. Africaine de Raffinage– M'Bao (Dakar)	**29,800**	**18,800**	....	....	**^{4}2,870**	....	....	**^{1}2,870**	....	....	....	....	....	....
SIERRA LEONE	Sierra Leone Petroleum Refining Co.–Freetown	**10,000**	....	....	....	....	....	....	....	....	....	....	....	....	....
SINGAPORE	BP Refinery Singapore PL Pasir Panjang	28,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Esso Singapore PL–Pulau Ayer Chawan	176,000	41,800	....	....	^{2}8,600	....	....	^{2}19,000 ^{4}48,400	....	..	7,000	3,400	....	....
	Mobil Oil Singapore PL–Jurong	193,000	70,000	^{3}45,000	....	^{2}14,000	....	^{4}5,700	^{1}22,000 ^{5}28,000	....	....	....	....	....	....
	Shell Eastern Petroleum Ltd.– Pulau Bukom	403,000	....	^{2}60,000	....	17,000	17,700	35,000	160,000	....	....	....	....	....	....
	Singapore Refinery CPL†– Pulau Merlimau	161,000	58,700	^{3}28,000	....	^{4}11,000	^{1}9,500 ^{4}17,000	^{4}36,000	^{1}11,000	....	....	....	4,300	^{2}18.0 ^{4}14.0 ^{5}7.0	....
	Total	**961,000**	**170,500**	**133,000**	....	**50,600**	**44,200**	**76,700**	**288,400**	....	....	**7,000**	**7,700**	**39.0**	....
	†Singapore Petroleum CPL shares percentages of refinery capacities.														
SOMALIA	Iraqsoma Ref. Co.–Mogadishu	**10,000**	....	....	....	....	....	....	....	....	....	....	....	....	....
SOUTH AFRICA	Caltex Oil SA PL–Cape Town	90,000	44,000	^{3}9,500	^{1}25,000	^{2}10,500	....	^{4}22,300	^{1}14,250	....	....	....	1,140	....	....
	Mobil Oil Refining Co.– Southern Africa PL–Durban	65,000	32,000	^{3}11,000	^{1}15,000	^{2}15,000	....	....	^{1}21,000 ^{5}28,000	^{2}2,200	^{1}1,700	....	4,000	....	....

WORLDWIDE REFINING	Company and refinery location		Charge capacity, b/cd							Production capacity, b/cd					Coke, tons/day
		Crude	Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics/isomerization	Lubes	Asphalt	Hydrogen, MMcfd	
	†Durban	....	....	....	....	....	....	....	....	....	....	3,000	....	....	....
	National Petroleum Refiners of South Africa PL–Sasolburg OFS	78,500	28,000	....	[1]17,400	[2]11,300	[1]8,600 [2]9,400	....	[1]11,300 [4]10,600	[2]4,800	[4]3,400	....	1,000	[1]25.0 [5]9.0	....
	Shell and BP South Africa Petroleum Refineries PL–Durban	155,000	73,000	[3]39,000	[1]24,000	[2]21,000	....	[4]44,000	[4]40,000	[2]2,100	....	....	1,000	....	....
	Total	**388,500**	**177,000**	**59,500**	**81,400**	**57,800**	**18,000**	**66,300**	**125,150**	**9,100**	**5,100**	**3,000**	**7,140**	**34.0**	....
SPAIN	Asfaltos Españoles SA–Tarragona	21,000	16,800		....		....	....	....	....		....			....
	Cia. Española de Petróles–San Roque (Cádiz)	160,000	40,000	[3]35,000	[1]30,000	[2]35,000			[4]24,000 [5]15,000	....	[1]12,500 [2]1,800	....	....	....	....
	Tenerife	130,000	12,000	[3]35,000		[2]13,000	....	....	[3]20,000	....		900	8,000	....	....
	EMP–Cartagena, Murcia	112,000	18,000	....		[2]25,000		[4]30,000	[2]29,000	....		3,500	3,500	....	....
	La Coruña	135,000	29,000	[2]10,500 [5]13,500	[1]25,000	[2]18,500		[4]17,000	[1]18,500	....			....	....	3,400
	Puertollano, Ciudad Real	135,000	64,000		[1]23,500	[2]18,000		[2]9,500 [4]21,000	[2]16,000 [3]2,400 [6]1,900	....	[2]1,700	3,000	3,500	[2]6.2	....
	Tarragona	180,000	63,000	[3]30,000	....	[2]16,000	[1]15,000	[2]22,000 [4]20,600	[2]16,000		....	....	....	[1]10.0	....
	Petroleos del Mediterraneo–Castellón de la Plana	112,000	24,000		[1]14,000	[2]14,000	....	[2]11,000 [4]25,000	[2]25,000	....		....	1,650	....	....
	Petronor SA–Somorrostro, Vizcaya	240,000	....			[2]33,500			[2]48,600 [4]40,700						
	Unión Explosivos Rio Tinto SA–La Rábida, Huelva	80,000	25,000			[2]14,100			[1]14,100 [4]8,000 [6]2,800	....	[1]2,420 [2]3,500 [3]1,800	1,900	6,900	[1]25.0 [5]6.0	....
	Total	**1,305,000**	**291,800**	**124,000**	**92,500**	**187,100**	**15,000**	**156,100**	**284,000**	....	**23,720**	**9,300**	**23,550**	**47.2**	**3,400**
SRI LANKA	Ceylon Petroleum Corp.–Sapugaskanda	50,000	1,900	[3]12,500		[2]3,750		[2]2,100	[1]8,000 [4]7,300	....			950	....	....
	Total	**50,000**	**1,900**	**12,500**	....	**3,750**	....	**2,100**	**15,300**	....	....	....	**950**	....	....
SUDAN	Port Sudan Refinery Ltd.–Port Sudan	**23,800**	....	....	....	**[1]1,700**	....	....	**[4]7,400**	....	....	....	....	....	....
SWEDEN	AB Nynas Petroleum–Gothenburg	12,500	9,000										8,500		
	Nynashamn	28,000	31,000						[6]2,500			2,500	20,000		
	BP Raffinaderi–Gothenburg	106,000				[2]20,500			[4]45,000						
	Shell Raffinaderi BV–Gothenburg	80,000		27,000		16,000		16,000	27,000						
	Skandinaviska Raffinaderi AB–Brofjorden-Lysekil	210,000	68,000	[3]41,000	[1]25,500	[4]37,500		[3]46,000 [4]30,000	[1]45,000	*3,300					
	Total	**436,500**	**108,000**	**68,000**	**25,500**	**74,000**	....	**92,000**	**119,500**	**3,300**	....	**2,500**	**28,500**	....	....
SWITZERLAND	Raffinerie de Cressier SA–Cressier	65,000		[1]24,000		15,000		8,000	27,000						
	Raffinerie du Sud-Ouest SA–Collombey	72,000				[2]10,000			[1]16,700						
	Total	**137,000**	....	**24,000**	....	**25,000**	....	**8,000**	**43,700**	....	....	....	....	....	....

†South African Oil Refinery PL is owner; Mobil is operator.

WORLDWIDE REFINING	Company and refinery location	Crude	Charge capacity, b/cd							Alky. *Poly.	Production capacity, b/cd			Hydrogen, MMcfd	Coke, tons/ day
			Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating		Aromatics/ isomerization	Lubes	Asphalt		
SYRIA	Banias Refining Co –Banias	126,350	54,101	[3]24,099	....	[3]16,728	....	....	[1]16,769 [4]6,828 [6]14,266	....	....	..	4,016	....	....
	Homs Refinery Co.-Homs	102,440	6,510	[5]17,100	....	[3]2,620	....	[4]26,040	....	....	....	....	4,020	9.5	685
	Total	**228,790**	**60,611**	**41,199**	....	**19,348**	....	**26,040**	**37,863**	....	....	....	**8,036**	**9.5**	**685**
TANZANIA	Tanzanian & Italian Petroleum Refining CL–Kigamboni, Dar es Salaam	**13,500**	....	....	....	**[2]3,000**	....	....	**[4]5,000**	....	....	....	....	....	....
THAILAND	Esso Standard Thailand Ltd.–Cholburi	63,000	6,200	....		[2]6,700		..	[2]16,200 [4]10,000 11,400	....	....	..	2,500	....	....
	Petroleum Authority of Thailand–Bangchak, Bangkok	65,000	....	....	....	[2]10,500	....	....	[1]5,500 [2]6,500 [7]18,000	....	....	..	.	[1]4.7	....
	Thai Oil Refinery CL–Sriracha, Cholburi	63,860	18,750	[3]9,600	[1]9,250	[1]2,800 [2]5,300	....	[2]10,000	[4]32,000	....	....	..	1,100	....	....
	Total	**191,860**	**24,950**	**9,600**	**9,250**	**25,300**	....	**10,000**	**99,600**	....	....	....	**3,600**	**4.7**	....
TOGO	Ste. Togolaise des Hydrocarbures–Lome	**20,000**	....	....	....	**[4]4,400**	....	....	**[1]7,600**	....	....	....	....	....	....
TRINIDAD	Trinidad and Tobago Oil CL–Pointe-a-Pierre	220,000	166,000	[3]18,000	[1]25,000	[4]25,000	....	[2]100,000	[5]18,000 [6]3,800	[1]2,200 *450	[1]2,800	2,700	....	....	....
	Point Fortin	80,000	5,000	....	....	[3]6,000	....	[5]4,500	[4]20,000	..	....	....	2,000	....	....
	Total	**300,000**	**171,000**	**18,000**	**25,000**	**31,000**	....	**104,500**	**41,800**	**2,650**	**2,800**	**2,700**	**2,000**	....	....
TUNISIA	Ste. Tunisienne Industries des Raffinage–Bizerte	**34,000**	....	....	....	**3,300**	....	....	....	....	....	....	....	....	....
TURKEY	Anadolu Tasfiyehanesi AS–Mersin	90,000				[2]10,500	....	....	[1]22,000 [4]11,500	....	....	....	....	....	....
	Turkish Petroleum Refineries Corp.: Aliaga-Izmir[1]	102,020	33,208		[1]14,000	[1]9,827	....	[2]4,777	[1]13,649 [7]5,460	....		3,830	5,441	[5]0.4	90
	Batman	20,000	3,500		[6]4,500	[1]1,300			[2]1,300	....	....	..	3,500		18
	Izmit	248,455	88,060		[1]20,100	[2]23,430			[1]26,600 [2]6,300 [4]45,300	....		..	8,800		....
	Total	**460,475**	**124,768**	....	**38,600**	**45,057**	....	**4,777**	**132,109**	....	....	**3,830**	**17,741**	**0.4**	**108**

Solvent extraction: [1]10,273 b/cd (furfural), 6,038 b/cd (propane deasphalting)

RLDWIDE EFINING		Company and refinery location	Crude	Charge capacity, b/cd							Production capacity, b/cd					
				Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydrocracking	Cat hydrorefining	Cat hydrotreating	Alky. *Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
NITED INGDOM	**England**	Conoco Ltd.–South Killingholme	130,000	55,000	[2]55,000 [5]60,000	....	[2]64,000	....	....	[4-5]143,000	....					1,900
		Esso Petroleum CL–Fawley	300,200	120,840	....	[1]76,500	[2]27,900 [4]22,500	....	....	[1-2]73,260 [4-5]104,130 [6]7,200	*12,600	[2]3,000 [6]19,000 [6]16,150	7,200	7,650	....	....
		Lindsey Oil Refinery Ltd.–Killingnolm, South Humberside	190,000	80,000	[3]26,000	[1]35,000	[2]33,600	....	[4]40,600	[1-2]45,400 [3]3,600	[1]4,100 *1,900	....	....	7,100	....	....
		Mobil Oil CL–Coryton, [illegible]	145,000	70,000	....	[1]47,000	[2]27,000	....	....	[1]35,000 [5]33,000	[2]13,500	[4]8,500	5,500	1,700	....	....
		Phillips Imperial Petroleum Ltd.–Port Clarence	100,000	....	....	....	....	....	....	....	....	....	....	8,000	....	....
		Philmac Oils Ltd.–Eastham, Cheshire	12,000	10,500	....	....	....	....	....	....	....	....	....	....	....	....
		Shell U.K. Ltd.–Shell Haven	90,000	....	....	....	32,000	19,000	17,000	62,000	....	....	....	....	....	....
		Stanlow	256,000	....	....	55,000	58,000	....	41,000	77,000	....	....	....	....	....	....
		Total	**1,223,200**	**336,340**	**141,000**	**231,500**	**265,000**	**19,000**	**98,600**	**583,590**	**32,100**	**46,650**	**12,700**	**24,450**	....	**1,900**
	Scotland	BP Refinery Grangemouth Ltd.–Grangemouth	178,500	76,000	....	[1]19,000	[2]32,000	....	....	[4]62,500	[2]3,800	....	....	....	[1]77.4	....
		William Briggs & Sons Ltd.—Dundee	6,000	5,250	....	....	....	....	....	....	....	....	....	4,000	....	....
		Total	**184,500**	**81,250**	....	**19,000**	**32,000**	....	....	**62,500**	**3,800**	....	....	**4,000**	**77.4**	....
	Wales	Amoco UK Ltd.–Milford H[illegible]	102,000	48,500	....	[1]31,500	[2]17,500	....	....	[2]17,500 [4]29,000	[2]3,100 †1,200	....	....	....	....	....
		BP Refinery Llandarcy Ltd.–Llandarcy, Neath	....	27,000	....	....	....	....	....	....	....	....	4,400	....	....	....
		Chevron Oil Co.–Milford Haven	90,000	37,000	....	....	[2]18,000	....	....	[2]29,000 [4]14,000	....	....	....	....	....	....
		Pembroke Cracking Co. (65% Texaco, 35% Chevron)	....	....	....	[1]81,500	....	....	....	....	[2]7,350	[4]4,165	....	....	....	....
		Texaco Ltd.–Pembroke, Dyfed	180,000	95,000	[3]25,000	....	[6]35,000	....	[4]33,000	[1]35,000	....	....	....	....	....	....
		Total	**372,000**	**207,500**	**25,000**	**113,000**	**70,500**	....	**33,000**	**124,500**	**11,650**	**4,165**	**4,400**	....	....	....
		Total United Kingdom	**1,779,700**	**625,090**	**166,000**	**345,500**	**367,500**	**19,000**	**131,600**	**770,590**	**47,550**	**50,815**	**17,100**	**28,450**	**77.4**	**1,900**

†Dimersol

URUGUAY		Administración Nacional de Combustibles, Alcohol y Portland–La Teja, Montevideo	45,000	12,000	....	[5]5,000	[1]3,000	....	....	[1]3,000 [4]5,000	....	....	....	3,000	....	....
		Total	**45,000**	**12,000**	....	**5,000**	**3,000**	....	....	**8,000**	....	....	....	**3,000**	....	....

U.S.S.R.

Government-owned refineries at Achinsk, Angarsk, Baku, Batumi, Chimkent, Drogobych, Fergana, Gorki, Grozny, Guryev, Ishimbai, Khabarovsk, Kherson, Kirishi, Komsomolsk, Krasnovodsk, Kremenchug, Kuibyshev, Lisichansk, Mazheikiai, Moscow, Mozyr, Nadvornaya, Nizhnekamsk, Odessa, Omsk, Orsk, Pavlodar, Perm, Polotsk, Ryazan, Saratov, Syzran, Tuapse, Ufa, Ukhta, Vannovskiy, Volgograd, and Yaroslavl

Total	**12,260,000**

WORLDWIDE REFINING	Company and refinery location	Charge capacity, b/cd								Production capacity, b/cd					
		Crude	Vacuum distillation	Thermal operations	Catalytic cracking	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alky. °Poly.	Aromatics/ isomerization	Lubes	Asphalt	Hydrogen, MMcfd	Coke, tons/ day
VENEZUELA	Corpoven–El Palito, Carabobo	105,000	63,200	....	[1]39,100	[1]6,000	....	....	....	[2]20,500	....	....	....	....	....
	El Toreño, Barinas	5,000	....	....	....	....	....	....	....	....	....	....	....	....	....
	Puerto La Cruz, Anzoategui	192,500	....	....	[1]11,400	....	....	....	....	[2]1,900	....	....	....	....	....
	Santa Ana, Anzoategui	5,200	1,700	....	....	....	....	....	....	....	....	....	....	....	....
	Lagoven–Judibana, Falcon	600,000	343,600	[6]47,000	[1]71,300	....	....	[2]162,000 [4]61,000	....	[2]16,000	[4]8,400	1,400	39,800	[1]83.0	100
	Maraven–Bajo Grande, Maracaibo	57,000	11,000	....	....	....	....	....	....	....	....	....	8,100	....	....
	Punta Cardon, Falcon	260,000	132,000	[3]75,000	[1]57,600	....	....	[2]31,500 [4]21,100	....	[2]22,650	[4]10,000	5,500	....	[1]26.0	....
	Total	**1,224,700**	**551,500**	**122,000**	**179,400**	**6,000**	....	**275,600**	....	**61,050**	**18,400**	**6,900**	**47,900**	**109.0**	**100**
VIRGIN ISLANDS	Hess Oil Virgin Islands Corp.–St. Croix	600,000	190,000	[3]40,000	....	[2]125,000	....	[2]130,000	[2]125,000 [4]165,000	....	[1]30,000 [5]15,000	....	....	....	....
	Total	**600,000**	**190,000**	**40,000**	....	**125,000**	....	**130,000**	**290,000**	....	**45,000**	....	....	....	....
YEMEN, N.	Yemen Hunt Oil Co.–Marib	**10,000**	....	....	....	**[1]2,500**	....	....	....	....	....	....	....	....	....
YEMEN, S.	Aden Refinery Co.–Little Aden	**170,000**	**10,000**	....	....	**[1]12,000**	....	....	....	....	....	....	....	....	....
YUGOSLAVIA	Bosanski Brod[1]	112,835	44,609	....	....	[2]7,612 [6]13,500	[1]7,200	....	[1]20,200 [4]13,438	....	....	....	13,310	[1]140.0	....
	Lendava	18,100	....	....	....	....	....	....	....	....	....	....	....	....	....
	Novi Sad	11,100	....	....	....	....	....	....	....	....	....	....	....	....	....
	Pancevo	29,878	....	....	....	3,996	....	8,793	....	....	....	....	....	....	....
	Rijeka	160,000	15,800	[3]6,100	....	18,500	....	3,000	5,000	....	3,300 6,300	1,900	5,000	....	....
	Sisak	150,000	15,700	[5]5,930	[1]10,000	[2]19,000	....	....	[1]16,900 [3]3,640 [5]2,700	....	[1]4,900	....	3,715	....	137
	Zagreb	600	500	....	....	....	....	....	....	....	....	1,200	....	....	....
	Total	**482,513**	**76,609**	**12,030**	**10,000**	**62,608**	**7,200**	**11,793**	**61,878**	....	**14,500**	**3,100**	**22,025**	**140.0**	**137**
	Solvent extraction: [1]3,300 b/cd (deasphalting)														
ZAIRE	Soc. Zairo-Italienne de Raffinage–Muanda	**17,000**	....	....	....	**[1]3,000**	....	....	**[1]5,000**	....	....	....	....	....	....
ZAMBIA	Indeni Petroleum Refinery CL–Bwana Nkubwa Area, Ndola	**25,000**	**2,400**	....	....	**[2]5,600**	....	....	**[4]9,000**	....	....	....	**960**	....	....

Worldwide oil and gas at a glance

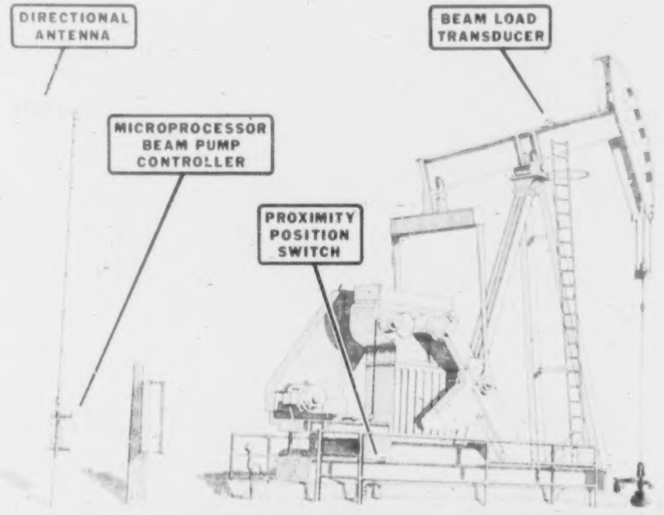
	ESTIMATED PROVED RESERVES 1-1-1987		OIL PRODUCTION			REFINING Capacity (b/cd) January 1, 1987				
COUNTRY	Oil (1,000 bbl)	Gas (10^9 cu ft)	Producing wells* July 1, 86	Estimated 1986 (1,000 b/d)	% change from 1985	No. of ref.	Crude	Thermal operations	Catalytic cracking	Catalytic reforming
ASIA-PACIFIC										
Australia	1,712,800	18,680	879	472.0	−16.9	10	626,100	...	181,800	154,600
Bangladesh	...	12,710	...	...	...	1	31,200	...	...	1,650
Brunei	1,420,900	7,060	710	170.0	+12.6	1	10,000	...	...	...
Burma	58,000	9,460	445	30.0	...	2	26,300	1,700	...	...
China, Taiwan	(c)5,400	910	84	1.9	−9.5	2	542,500	17,493	22,600	51,960
India	4,202,800	17,550	3,241	622.7	+0.9	12	991,070	104,730	129,408	26,690
Indonesia	8,300,000	49,440	5,124	1,243.8	+1.5	6	635,800	81,500	...	60,700
Japan	57,000	1,090	284	12.8	+20.8	46	4,790,050	80,520	502,750	561,420
Korea, South	...	...	...	...	...	6	862,000	30,000	...	63,200
Malaysia	2,820,500	49,440	370	503.3	+16.2	4	212,300	...	...	21,410
New Zealand	(c)167,000	5,690	32	29.3	+54.2	1	54,000	...	...	26,000
Pakistan	96,000	18,700	55	41.0	+17.1	3	130,000	...	...	5,750
Papua New Guinea	(c)65,000	500	...	...	...	...	...	...	...	...
Philippines	16,900	10	10	6.3	−25.9	3	286,000	...	23,100	40,200
Singapore	...	...	...	...	...	5	961,000	133,000	...	50,600
Sri Lanka	...	...	...	...	...	1	50,000	12,500	...	3,750
Thailand	101,200	7,400	180	35.6	+1.7	3	191,860	9,600	9,250	25,300
Total Asia-Pacific	**19,023,500**	**198,640**	**11,414**	**3,168.7**	**+1.1**	**106**	**10,400,180**	**471,043**	**868,908**	**1,093,230**
WESTERN EUROPE										
Austria	76,300	420	1,609	22.2	+0.9	1	204,000	17,000	24,000	31,000
Belgium	...	...	...	...	...	4	647,500	65,500	102,000	80,300
Cyprus	...	...	...	...	...	1	16,000	...	...	3,400
Denmark	440,000	3,400	NA	74.7	+26.6	3	166,000	72,800	...	29,900
Finland	...	...	...	...	...	2	241,000	46,300	41,800	55,100
France	234,900	1,230	649	59.0	+15.7	15	1,834,050	167,400	252,300	239,300
Germany, West	316,000	6,500	3,129	80.0	−1.2	19	1,719,800	269,400	186,200	317,000
Greece	26,000	...	16	26.4	+1.5	4	384,500	19,520	27,200	31,300
Ireland	...	1,940	...	...	...	1	56,000	...	...	11,000
Italy-Sicily	721,750	8,000	220	49.0	+22.5	21	2,678,700	345,130	276,000	296,600
Netherlands	194,900	70,400	663	79.0	+11.3	7	1,400,800	148,710	125,500	150,400
Norway	10,500,000	103,180	178	823.3	+5.0	3	240,000	86,500	...	29,150
Portugal	...	...	...	...	...	3	294,300	...	10,100	35,400
Spain	28,200	800	47	37.2	−17.3	10	1,305,000	124,000	92,500	187,100
Sweden	...	...	...	...	...	5	436,500	68,000	25,500	74,000
Switzerland	...	...	...	...	...	1	65,000	24,000	...	15,000
Turkey	400,000	460	471	46.8	+11.4	4	460,475	...	38,600	45,057
United Kingdom	9,000,000	33,400	661	2,602.0	+2.8	15	1,779,700	166,000	345,500	367,500
Total Western Europe	**21,938,050**	**229,730**	**7,643**	**3,899.6**	**+3.9**	**119**	**13,929,325**	**1,620,260**	**1,547,200**	**1,998,507**
MIDDLE EAST										
Abu Dhabi	31,000,000	90,000	468	949.0	+31.8	3	185,250	...	...	29,569
Bahrain	140,000	7,000	280	44.0	+4.8	1	250,000	19,000	36,000	17,100
Dubai	1,350,000	4,400	149	350.0	+0.6	...	...	...	...	...
Iran	48,800,000	450,000	361	1,806.3	−20.0	4	530,000	80,800	...	63,845
Iraq	47,100,000	28,000	NA	1,787.7	+24.6	8	318,500	...	...	43,500
Israel	700	10	9	0.1	...	2	180,000	70,000	20,000	26,000
Jordan	...	...	...	...	...	1	100,000	...	4,410	8,640
Kuwait	91,916,000	35,000	363	1,202.0	+40.7	4	618,000	...	30,000	51,000
Lebanon	...	...	...	...	...	2	37,000	...	7,250	7,492
Neutral Zone	5,212,100	12,400	493	325.7	−7.2	...	...	...	...	...
Oman	4,032,000	7,500	736	540.8	+11.3	1	48,032	...	...	9,644
Qatar	3,154,000	152,000	174	332.3	+11.1	1	62,000	...	...	22,030
Ras al Khaimah	200,000	1,200	6	11.0	+22.2	...	...	...	...	...
Saudi Arabia	166,573,900	123,990	NA	4,719.7	+43.9	6	1,125,000	26,000	10,000	86,900
Sharjah	500,000	9,000	20	65.0	...	...	...	...	...	...
Syria	1,400,000	4,200	847	185.0	+3.9	2	228,790	41,199	...	19,348
Yemen, North	500,000	600	45	10.0	...	1	10,000	...	...	2,500
Yemen, South	...	...	...	...	...	1	170,000	...	...	12,000
Total Middle East	**401,878,700**	**925,300**	**3,951**	**12,328.6**	**+19.4**	**37**	**3,862,622**	**236,999**	**107,660**	**399,568**

EDITOR'S NOTE: All reserves figures except those for the U.S.S.R. (and gas for Canada) are reported as proved reserves recoverable with present technology and prices. U.S.S.R. figures are "explored reserves" that include proved, probable, and some possible. Canadian gas figure, under criteria adopted by Canadian Petroleum Association in 1980, includes proved and some probable. (c)Condensate. *Does not include shut in, injection, or service wells. †Estimates based on capacity as of Jan. 1, 1986, plus known 1986 closures and expansions. §Includes Albania, Bulgaria, Cuba, Czechoslovakia, East Germany, Hungary, Mongolia, North Korea, Poland, Romania, Viet Nam, and Yugolsavia.

	ESTIMATED PROVED RESERVES 1-1-1987		OIL PRODUCTION				REFINING Capacity (b/cd) January 1, 1987			
COUNTRY	Oil (1,000 bbl)	Gas (10⁹ cu ft)	Producing wells* July 1, 86	Estimated 1986 (1,000 b/d)	% change from 1985	No. of ref.	Crude	Thermal operations	Catalytic cracking	Catalytic reforming
AFRICA										
Algeria	8,800,000	106,000	NA	600.7	−7.4	4	464,700	...	...	55,600
Angola-Cabinda	1,149,400	1,800	363	280.7	+24.8	1	32,100	...	...	1,900
Benin	100,000	...	6	7.0	+1.4	...	...	...	...	...
Cameroon	540,000	3,800	173	180.0	+34.3	1	43,000	...	...	6,500
Congo	720,000	2,500	286	115.0	+16.2	1	21,000	...	...	2,000
Egypt	3,600,000	8,900	666	773.7	−11.6	7	452,110	16,470	...	30,940
Ethiopia	...	...	...	...	...	1	18,000	...	...	2,200
Gabon	645,000	500	294	146.2	−4.4	1	15,600	7,200	...	1,400
Ghana	2,350	...	3	0.3	−40.0	1	28,000	...	...	5,550
Ivory Coast	125,000	3,400	20	20.0	−28.6	2	73,000	...	...	13,500
Kenya	...	...	...	...	...	1	95,000	...	...	9,000
Liberia	...	...	...	...	...	1	15,000	...	...	2,000
Libya	21,300,000	21,180	661	1,030.7	−2.0	3	329,400	...	...	14,582
Madagascar	...	...	...	...	...	1	16,350	...	...	2,600
Morocco	300	130	NA	0.3	...	2	81,303	...	5,600	13,735
Mozambique	...	...	...	...	...	1	17,000	...	...	2,500
Nigeria	16,000,000	47,000	1,111	1,464.0	−1.1	3	250,400	...	44,100	38,100
Senegal	...	...	...	...	...	1	29,800	...	...	2,870
Sierra Leone	...	...	...	...	...	1	10,000	...	...	...
Somalia	...	...	...	...	...	1	10,000	...	...	...
South Africa	...	...	...	...	...	5	388,500	59,500	81,400	57,800
Sudan	300,000	...	...	...	...	1	23,800	...	...	1,700
Tanzania	...	3,000	...	...	...	1	13,500	...	...	3,000
Togo	...	...	...	...	...	1	20,000	...	...	4,400
Tunisia	1,800,000	3,200	147	106.0	+1.9	1	34,000	...	...	3,300
Zaire	112,000	30	108	32.1	−8.3	1	17,000	...	...	3,000
Zambia	...	...	...	...	...	1	25,000	...	...	5,600
Total Africa	**55,194,050**	**201,440**	**3,838**	**4,756.7**	**−1.8**	**45**	**2,523,563**	**83,170**	**131,100**	**283,777**
WESTERN HEMISPHERE										
Argentina	2,270,000	23,000	8,774	430.2	−3.8	11	669,800	120,800	110,750	38,300
Barbados	500	...	95	1.8	−5.3	1	3,000	...	...	...
Bolivia	149,000	4,840	346	18.7	−11.0	3	46,930	...	...	14,158
Brazil	2,350,000	3,200	3,514	578.0	+5.7	13	1,321,100	41,100	321,900	21,600
Canada	6,850,000	99,600	50,037	1,475.3	+0.9	27	1,759,700	76,100	370,300	345,100
Chile	290,000	4,200	353	34.4	+4.2	3	150,450	8,400	34,000	5,300
Colombia	1,290,500	4,000	2,747	324.2	+83.2	4	226,000	61,000	91,000	6,000
Costa Rica	...	...	...	...	...	1	15,600	6,500	...	1,200
Dominican Republic	...	...	...	...	...	2	44,000	...	...	8,300
Ecuador	1,672,300	4,050	934	270.1	−2.5	3	87,600	12,600	12,600	2,780
El Salvador	...	...	...	...	...	1	17,000	...	...	3,000
Guatemala	23,000	30	8	4.9	+11.4	1	16,000	...	...	3,000
Honduras	...	...	...	...	...	1	14,000	...	...	1,800
Jamaica	...	...	...	...	...	1	35,500	...	...	3,540
Martinique	...	...	...	...	...	1	12,800	...	...	3,000
Mexico	54,653,000	76,500	3,737	2,468.0	−9.7	9	1,349,000	82,000	267,000	137,800
Netherlands Antilles	...	...	...	...	...	1	320,000	67,000	42,000	15,000
Nicaragua	...	...	...	...	...	1	14,500	...	...	2,800
Panama	...	...	...	...	...	1	100,000	...	...	7,500
Paraguay	...	...	...	...	...	1	7,500	...	...	...
Peru	546,000	850	3,577	179.0	−5.8	6	175,560	...	21,670	1,680
Puerto Rico	...	...	...	...	...	2	121,000	...	12,000	5,800
Suriname	1,000	...	47	1.8	+50.0		...	...	...	...
Trinidad & Tobago	610,000	10,400	3,211	167.9	−5.1	2	300,000	18,000	25,000	31,000
Uruguay	...	...	...	...	...	1	45,000	...	5,000	3,000
Venezuela	25,000,000	59,000	10,103	1,664.9	+6.9	7	1,224,700	122,000	179,400	6,000
Virgin Islands	...	...	...	...	...	1	600,000	40,000	...	125,000
United States	24,560,000	185,400	639,735	8,790.0	−2.0	†189	†15,258,214	†1,847,750	†5,234,100	†3,673,000
Total Western Hemisphere	**120,165,300**	**475,070**	**727,218**	**16,409.2**	**−1.2**	**294**	**23,934,954**	**2,503,250**	**6,726,720**	**4,465,658**
Total non-Communist	**618,199,600**	**2,030,180**	**754,064**	**40,562.8**	**+4.9**	**601**	**54,650,644**	**4,914,722**	**9,381,588**	**8,240,740**
COMMUNIST AREAS										
China	18,400,000	30,000	NA	2,590.0	+3.8	40	2,200,000	NA	NA	NA
U.S.S.R	59,000,000	1,550,000	130,000	12,300.0	+3.4	39	12,260,000	NA	NA	NA
Other§	1,850,000	15,800	NA	427.0	−5.7	45	3,150,000	NA	NA	NA
Total Communist	**79,250,000**	**1,595,800**	**130,000**	**15,317.0**	**+3.2**	**124**	**17,610,000**	**NA**	**NA**	**NA**

OGJ REPORT

Production/Enhanced Recovery Report


DIRECTIONAL ANTENNA
BEAM LOAD TRANSDUCER
MICROPROCESSOR BEAM PUMP CONTROLLER
PROXIMITY POSITION SWITCH

Artist sketch of remote pumping well. Transducer on walking beam is connected by cable to microprocessor/UART modem for transmission of data via radio to host computer.

Increased rate of EOR brightens outlook

Jim Leonard
Production Editor

Continuing its growing presence, enhanced oil recovery (EOR) now contributes about 604,800 bbl to total U.S. daily crude oil production (Table 1) from 512 reported projects (Table 2). The 1986 OGJ survey reveals another 108 domestic EOR projects are targeted to commence over the next 1-2 years (Table A).

Total reported EOR projects have increased 37.3% over the 1984 survey, and total reported daily production has increased 31.2%. EOR now represents over 6.8% of total domestic crude production. Following is a closer look at activity in the various EOR categories and some technology highlights.

Thermal

The OGJ survey reveals 201 active U.S. thermal projects produce nearly 480,000 b/d. In terms of market share, the steam process alone contributes 77.5% to total domestic EOR of 604,000 b/d.

Of course the magnitude of heavy oil reserves, improving technology, and maturity of the larger projects assure production dominance of the steam injection process for years to come.

Its increasing success over the past decade in terms of productivity and number of projects indicates its status as our most mature EOR technology.

Kern County. The focal point of domestic thermal operations is still Kern County, California, where "huff and puff" gave birth to today's steam drive technology.

As a project matures, production capacity increases in most cases. Texaco's (formerly Getty's) Kern River field reports nearly 98,500 b/d of EOR as this steam project approaches maturity. The 1984 survey reported 95,000 b/d.

Shell Oil Co.'s South Belridge field steam project produced 70,000 b/d of EOR when OGJ published the results of its 1984 survey. Our 1986 survey reports this project's EOR production of 13 gravity oil at 89,000 b/d. And since Shell has no plans to reduce its commitment to research, improved technology will be followed by improved oil recovery.

Steam generation/cogeneration. Perhaps one of the biggest incentives California oil operators could have for expansion of thermal EOR is to have access to reliable, long term supplies of out-of-state natural gas for steam generation and cogeneration facilities.

Conversion of oil-fired steam generators to gas-fired would significantly increase EOR production as well as minimize environmental and pollution concerns.

There is a struggle under way for the California thermal EOR/cogeneration gas market. New intrastate contract carriage rates and terms give utilities an edge to meet the market with existing systems.

But producers still back interstate lines to avoid the risk of supply interruptibility.

Gas projects

Total gas projects have increased a healthy 23.8% and production has increased 30.4% to over 108,000 b/d. These figures are all the more impressive considering that an unexpected number of operators declined to participate in the survey.

Permian basin. Although mobility/confinement and reservoir heterogeneity present giant challenges, operators have bet over $2 billion that the CO_2 miscible process will succeed in various fields throughout the Permian Basin.

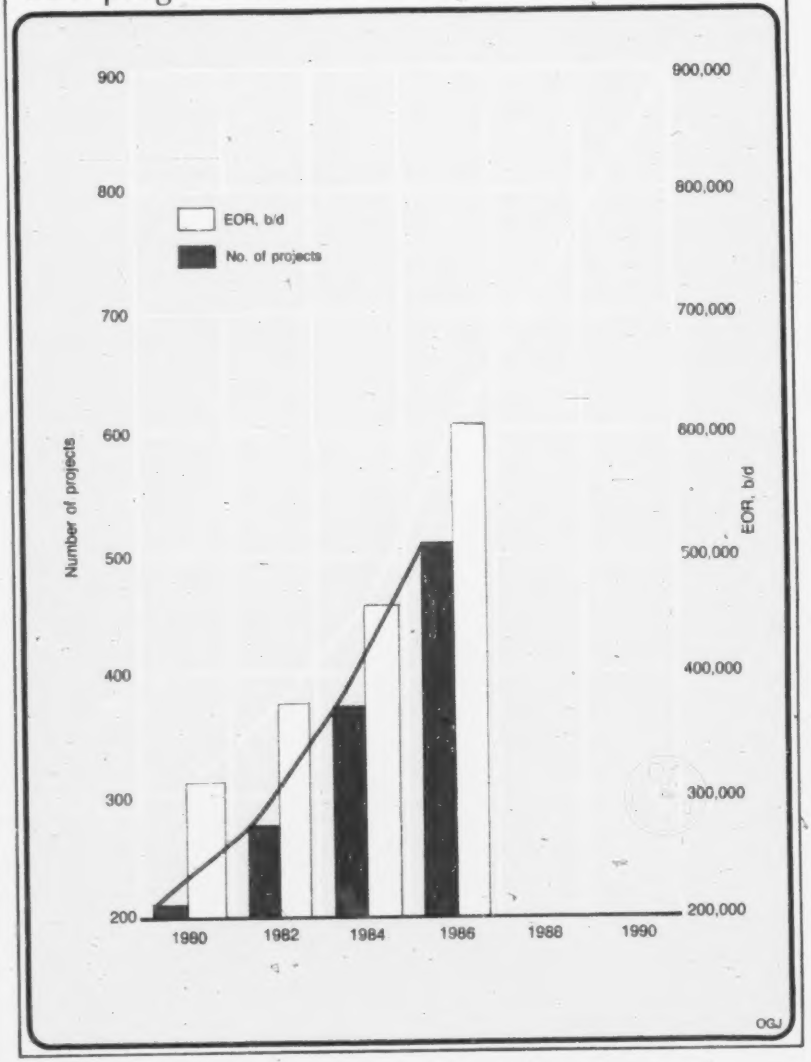
The high mobility of injected CO_2 has been a major contributing cause for past project failure, but research has identified foams and gels which have proved economically successful for mobility control and sweep efficiency.

Meanwhile their use has also pointed to the need for a more detailed description of reservoir heterogeneity when evaluating for EOR via the CO_2 process.

The lag time between implementation and reservoir response indicates that the Permian Basin will not make its most significant contribution to EOR until the 1990s.

Fig. 1

EOR progress in U.S.



Prudhoe Bay. Arco's enriched hydrocarbon miscible project on the east side of Prudhoe Bay field has been in operation for a little over 2 years.

Although none of the current 65,000 b/d is classified as EOR (lag time), this project holds special significance.

As the project matures, the degree of success measured here in terms of EOR barrels to total production will suggest the magnitude of U.S. reserve potential in the Arctic region from proved reservoirs.

CO_2 immiscible. The number of CO_2 immiscible projects jumped 55.6% since out 1984 survey; however, their total EOR output is still small because most of the projects are relatively new.

Note that Texaco plans 27 new immiscible projects in South Louisiana for 1986-87.

Chemical processes

Gains in the polymer process are impressive in terms of production and number of projects. Production is up 49.7% to over 15,300 b/d, and number of projects increased to 178—up 67.9%. Alkaline and micellar-polymer projects declined both in number of projects and EOR production.

Micellar-polymer decline. The micellar-polymer (surfactant-polymer) flood process is complex, not thoroughly understood, prohibitively expensive, and requires a massive infusion of technological research.

Ordinarily the surfactant slug consists of petroleum sulfonates mixed with other chemicals and water. The purpose of the slug is to lower interfacial tension and displace residual oil that cannot be displaced by water alone.

The surfactant slug is displaced

U.S. EOR production

	b/d 1980	1982	1984	1986	Change from 1984, %
Thermal					
Steam	243,477	288,396	358,115	468,692	+ 30.9
Combustion in situ	12,133	10,228	6,445	10,272	+ 59.4
Hot water	—	—	—	705	0.0
Total thermal	**255,610**	**298,624**	**364,560**	**479,669**	**+ 31.6**
Chemical					
Micellar-polymer	930	902	2,832	1,403	− 50.5
Polymer	924	2,927	10,232	15,313	+ 49.7
Caustic	550	580	334	185	− 44.6
Total chemical	**2,404**	**4,409**	**13,398**	**16,901**	**+ 26.2**
Gases					
Hydrocarbon miscible	—	—	14,439	33,767	+133.9
CO_2 miscible	21,532	21,953	31,300	28,440	− 9.2
CO_2 immiscible	—	—	702	1,349	+ 92.2
Nitrogen	—	—	7,170	18,510	+158.2
Flue gas (miscible and immiscible)	—	—	29,400	26,150	− 11.1
Total gases	**74,807**	**71,915**	**83,011**	**108,216**	**+ 30.4**
Other					
Carbonated waterflood	—	—	—	—	
Grand total	**332,821**	**374,948**	**460,969**	**604,786**	**+ 31.2**

Guide to EOR project tabulations

Table A: More EOR projects planned for U.S.
Table B: Worldwide projects planned (Canada, So. America, etc.)
Table C: EOR efforts in Canada increasing
Table D: Latin American activity
Table E: Other foreign activity
Table F: Steam EOR still leads U.S.
Table G: Chemical floods make largest gains in U.S.
Table H: CO_2 and other gas projects in U.S.
Table I: Combustion methods underway in U.S.

ABBREVIATIONS

Formation type
S = Sandstone
LS = Limestone
Dolo. = Dolomite
Congl. = Conglomerate

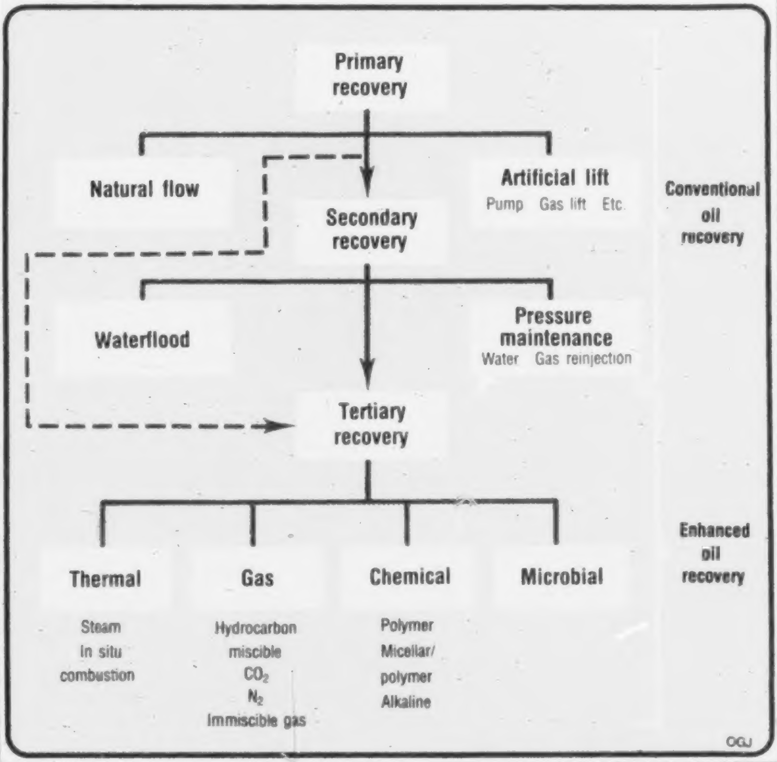
Project maturity
JS = Just started
HF = Half finished
NC = Nearing completion
Term. = Terminated

Previous production
Prim. = Primary
WF = Waterflood

Project evaluation
TETT = Too early to tell
Prom. = Promising
Succ. = Successful
Disc. = Discouraging
NE = Not evaluated

Fig. 2

Recovery mechanisms


Primary recovery
Natural flow
Artificial lift
Pump Gas lift Etc.
Secondary recovery
Conventional oil recovery
Waterflood
Pressure maintenance
Water Gas reinjection
Tertiary recovery
Thermal
Gas
Chemical
Microbial
Enhanced oil recovery
Steam
In situ combustion
Hydrocarbon miscible
CO_2
N_2
Immiscible gas
Polymer
Micellar/polymer
Alkaline
OGJ

through the reservoir by a polymer slug of equal or greater viscosity for mobility control.

Since the purpose of a surfactant slug is to reduce interfacial tension, any dilution of the surfactant by extraneous reservoir fluids reduces its effectiveness.

In addition, adsorption of the surfactant on the reservoir rock is a major cause of slug breakdown. Still other challenges include increasing an injected chemical's tolerance to higher temperatures, varying salinities, and shear degradation.

As we said—it's complex. And the prevailing economic climate encourages the operator to seek an alternative process.

Activity outside the U.S.

Canada. It's possible that tax and royalty incentives provided the impetus for the most encouraging boost in Canadian EOR activity.

Our 1986 survey reports EOR production of 102,207 b/d from 65 projects, which equates to an increase of 37.4% for production and a surprising jump of 62.5% in the number of projects.

Two small unsuccessful steam projects were terminated in September 1985, but 23 new projects are planned for 1986-87.

Latin America. Venezuela's Maraven and Trinidad/Tobago's Trintoc were the only two Latin American respondents to our survey. Maraven reported 162,000 b/d from 26 projects, and Trintoc reported 2,345 b/d from 5 projects.

Other foreign activity. Survey responses were received from Congo, France, Germany, Italy, and Indonesia (Table E).

Other information shows that in Libya, the Intisar "D" field produces 55,000 b/d of EOR. Implemented by Occidental Petroleum in December 1969, recovery estimates range as high as 70% of the original oil in place. The process will undoubtedly be implemented in other Libyan oil fields.

In Algeria, the supergiant Hassi Messaoud field produces about 250,000 b/d of EOR via the hydrocarbon miscible gas process. Here too, the process will have wide application for numerous other fields.

Bahrain has undertaken an extensive program to study various processes for EOR. In addition to recovery of light crudes, Bahrain National Oil Co. is considering steam injection and in situ combustion for heavy crude.

The United Arab Emirates has established a separate company for EOR activities. Laboratory evaluations have been conducted to test the applicability of miscible and immiscible gas injection processes.

Saudi Arabia, Tunisia, and Kuwait have also conducted research investigating the suitability of miscible flooding—including CO_2.

Although large deposits of heavy oil exist in the Middle East, limited availability of fresh water precludes a significant contribution to EOR by steam injection.

The miscible gas process will make the most significant contribution to EOR.

Microprocessors

Pumping well. When a prudent operator has the option to squeeze a little more performance out of his operations, he jumps at it. And well he should, when it comes in the form of a microprocessor standing sentry 24 hr a day helping run a "smarter" field operation. In an EOR operation for instance, a remote terminal (microprocessor) can monitor a pumping well. A beam load transducer (on the walking beam) transmits an indirect measurement of the polished rod load via cable to the microprocessor.

More EOR projects planned for U.S.

Operator	Type project	Field	State	Size, acres	Pay zone	Depth, ft	Gravity, °API	Target date
Amoco	CO_2 miscible	Levelland	Tex.	16,340	San Andres	4,900	30	87
Amoco	CO_2 miscible	Anton Irish	Tex.	8,545	Clearfork	5,900	28	87
Amoco	CO_2 miscible	Slaughter	Tex.	2,000	San Andres	4,950	31	87
Amoco	CO_2 miscible	Wertz	Wyo.	1,600	Tensleep	6,200	—	86
Amoco	Polymer	Slaughter	Tex.	3,500	San Andres	4,950	31	86
ARCO	CO_2	Wasson-Willard	Tex.	8,000	San Andres	5,100	32	2/86
ARCO	Polymer	Dundee Healdton Unit	Okla.	660	Penn	1,000	31	86
Chevron	Steam	Midway-Sunset	Calif.	27	Tulare	1,200	11	5/86
Chevron	Steam	Coalinga Sec. 31A	Calif.	100	Temblor	900	14	1/87
Chevron	CO_2 miscible	Rangely	Colo.	19,000	Weber	6,500	34	6/86
Cities Service	Steam	South Kern Front	Calif.	80	Etchegoin chanac	1,500	14	1/88
Cities Service	Steam	North Kern Front	Calif.	342	Etchegoin	1,300-1,500	14	1/87
Citronelle Unit	Polymer	Citronelle	Ala.	—	Rodessa	10,600	42-45	1/86
Citronelle Unit	Immiscible CO_2	Citronelle	Ala.	—	Rodessa	10,600	42-45	1/86
Conoco	Polymer	San Miguelito	Calif.	436	First & Second Grubb	6,100	28	5/86
Conoco	Polymer	Round Top	Tex.	3,121	Palo Pinto Reef	4,760	40.5	6/86
Conoco	CO_2	Maljamar	N.M.	3,920	Grayburg/San Andres	3,665	36	7/87
Conoco	CO_2	W. Sussex	Wyo.	1,740	Shannon	3,040	38	7/88
Conoco	CO_2	E. Huntley	Tex.	1,308	San Andres	3,180	36	7/87
Conoco	CO_2	McCallum	Colo.	813	Pierre "B"	800	28	8/86
Conoco	Steam	Loco	Okla.	Variable	Multi-zones	300-1,000	19-23	7/86
Mitchell	Polymer	Alba	Tex.	512	Sub-Clarksville	4,010	15.5	6/86
Mobil	CO_2	Postle	Okla.	23,000	Morrow	6,200	40	1989
Mobil	Polymer	Stephens Co.	Tex.	4,257	Caddo	3,200	40	1986
Mobil	Polymer	Stephens Co.	Tex.	2,384	Caddo	3,100	40	1986
Santa Fe Energy	Polymer	Candy Draw	Wyo.	500-600	Minnelusa	7,300	26	1986
Santa Fe Energy	Combustion	Midway-Sunset	Calif.	600	Tulare	1,250	11.5	86
Santa Fe Energy	Steam	Midway-Sunset	Calif.	1,000	Tulare	1,250	11.5	8/86
Santa Fe Energy	Steam	Brea Olinda	Calif.	35	Anaheim	900	13	1/1/87
Shell	Steam	Arroyo Grande	Calif.	254	Upper M6	400 ss	15	3/86
Shell	Steam	Olinda	Calif.	45	B8-B16	3,000	20	10/86
Shell	Steam	Cat Canyon	Calif.	2½	Brooks	3,300	10	1/86
Shell	Alkaline	White Castle	La.	3	Q Sand	5,700	32	3/86
Shell	CO_2	Olive	Miss.	1,000	Lower Tuscaloosa	10,500	39	3/86
Shell	CO_2	West Mallalieu	Miss.	5,760	Lower Tuscaloosa	10,365	38	5/86
Shell	CO_2	Weeks Island	La.	971	M thru S sds.	11,000-14,000	33	1/87
Shell	CO_2	White Castle	La.	200	NW Sand	12,000	34	3/86
Shell	Polymer	Monahans	Tex.	1,060	Queen	3,200	32	1/86
Shell	Polymer	Harper	Tex.	4,240	San Andres	4,000	37	87
Shell	Polymer	McElroy	Tex.	520	Grayburg	2,900	32	8/86
Shell	Polymer	Monahans	Tex.	4,800	Clearfork	4,700	32	4/86
Shell	Polymer	Bedford	Tex.	1,000	Devonian	9,000	32	87
Shell	Polymer	Dune	Tex.	200	San Andres	3,450	29	87
Shell	Polymer	Flanagan	Tex.	5,400	Clearfork	6,400	35	87
Shell	Polymer	Jordan	Tex.	3,820	San Andres	3,400	36	87
Shell	Polymer	TXL North	Tex.	8,440	Tubb	5,400	37	87
Tenneco	Steam	Kern River	Calif.	8	Kern River	1,200	13	1986
Tenneco	Steam	Midway-Sunset	Calif.	8	U. Monarch	1,200	12	1986
Tenneco	Steam	Placerita	Calif.	300	Kraft	1,500	12	1986
Texaco	Steam	San Ardo	Calif.	40	Lombardi	1,900	11	1/87
Texaco	Steam	San Ardo	Calif.	100	Aurignac	2,200	13	1987
Texaco	Steam	Midway	Calif.	5	Tulare	1,300	12	1/87
Texaco	Steam	Midway	Calif.	30	Potter	1,650	12-13	1987
Texaco	Steam	Coalinga	Calif.	50	Etchegoin Temblor	500-800	13	1986
Texaco	Steam	Wilcox	Calif.	16.5	Basal Etchegoin	2,400	12.3	1987
Texaco	Steam	Wilcox	Calif.	16.5	Basal Etchegoin	2,400	12.3	1987
Texaco	Polymer	Sho-Vel-Tum	Okla.	1,128	Tussy	3,000	43	1986
Texaco	Polymer	Sho-Vel-Tum	Okla.	130	Permian	250-1,150	30	1986
Texaco	Polymer	Sho-Vel-Tum	Okla.	420	Permian	1,000	—	1986
Texaco	Polymer	Sho-Vel-Tum	Okla.	300	Humphreys	3,500	21	1986
Texaco	Polymer	Cahoj	Kan.	2,880	Lansing-KC	3,900	34	1986
Texaco	Polymer	EMOR	Kan.	1,120	Toronto-Lansing KC	4,000	38	1986
Texaco	Polymer	Cushing	Okla.	680	Bartlesville	2,800	40	1986
Texaco	Polymer	Blue Buttes	NO	12,777	Madison	9,200	41.6	7/86
Texaco	Polymer	Big Wall	Mt.	404	Tyler	2,960	30	3/86
Texaco	Polymer	Bowes	Mt.	2,680	Sawtooth	3,460	19	6/86

When the well pumps off or a downhole equipment malfunction occurs, the pumping unit is automatically shut down. Software transmits data through a UART (universal asynchronous receiver transmitter) to a modem and then via radio or telephone to the host computer.

The position switch detects a fixed point in the stroke from which the microprocessor calculates polished rod position throughout the stroke. Calculated polished rod position and measured load can then be used to produce a dynagraph card (graphic representation). A hard copy of the card is available either at the wellhead or the host computer. Past performance cards are stored in the microprocessor's registers, and can be recalled at any time by the host computer.

Injection control manifold. In an EOR operation, the microprocessor also plays an important role in the control of injected fluids because it controls injection rate and pressure within set points established by the reservoir engineer.

A flow meter measures flow rate and volume, while a transducer measures pressure downstream from the control valve. These data are fed to the microprocessor software which controls the maximum injection of fluids within the set point limits by modulating the control valve.

These data also are communicated to the host computer.

Outlook

Price volatility due to supply/demand imbalance seems to have encouraged companies to position themselves toward low risk investment for

Table A

Operator	Type project	Field	State	Size, acres	Pay zone	Depth, ft	Gravity, °API	Target date
Texaco	Polymer	Wilson Creek	Co.	7,077	Morrison	6,200	43	6/86
Texaco	Polymer	Ismay Flodine Park Unit	Utah	5416	Ismay	5,800	46.3	9/86
Texaco	Polymer	Levelland	Tex.	700	San Andres	4,820	30.0	3/1/86
Texaco	Polymer	Levelland	Tex	2,437	San Andres	4,760	29.7	3/1/86
Texaco	Polymer	Levelland	Tex	1,233	San Andres	4,720	30.5	7/1/86
Texaco	Polymer	Slaughter	Tex.	340	San Andres	5,000	31	11/86
Texaco	Polymer	W. Pachuta Creek	Miss.	1,596	Smackover	13,000	37.5	2/86
Texaco	Immiscible CO_2	West Delta 109	La.	85	9,000 Foot	8,700	38.3	4/86
Texaco	Immiscible CO_2	West Delta 109	La.	100	9,200 Foot	9,575	38.1	4/86
Texaco	Immiscible CO_2	West Delta 109	La.	30	9,800-Foot	10,500	37.1	4/86
Texaco	Immiscible CO_2	West Delta 109	La.	87	10,000-Foot	10,000	37.4	4/86
Texaco	Immiscible CO_2	West Delta 109	La	72	10,500-Foot	10,500	39.0	5/86
Texaco	Immiscible CO_2	West Delta 109	La	17	10,500-Foot	9,800	37.5	5/86
Texaco	Immiscible CO_2	West Delta 109	La	36	10,800-Foot	9,950	38.3	5/86
Texaco	Immiscible CO_2	West Delta 109	La.	28	12,500-Foot	12,400	31.3	5/86
Texaco	Immiscible CO_2	Vermilion 380	La.	133	Y-1	5,200	40.5	6/86
Texaco	Immiscible CO_2	Vermilion 380	La.	150	Y-1	5,500	40.0	6/86
Texaco	Immiscible CO_2	Vermilion 380	La.	162	Y 3A	6,000	33.5	6/86
Texaco	Immiscible CO_2	Lafitte	La.	300	6,500-Foot	6,500	25.9	1/87
Texaco	Immiscible CO_2	Lafitte	La.	100	4,200-Foot	4,350	28.0	1/87
Texaco	Immiscible CO_2	Lafitte	La	200	4,050-Foot	4,000	21.5	2/87
Texaco	Immiscible CO_2	Golden Meadow	La.	150	10,000-Foot	10,100	37.0	2/87
Texaco	Immiscible CO_2	Bayou Fer Blanc	La.	175	McGowan	13,500	39.0	2/87
Texaco	Immiscible CO_2	Lake Pelto	La.	60	38 Sand	8,400	31.0	3/87
Texaco	Immiscible CO_2	Delacroix	La.	600	7,900-Foot	7,900	38.0	3/87
Texaco	Immiscible CO_2	Bay De Chene	La.	175	7,500-Foot	7,500	34.0	3/87
Texaco	Immiscible CO_2	Bonnet Carre	La.	1,014	9,400-Foot	9,400	37.0	2/86
Texaco	Immiscible CO_2	Boutte	La.	353	Simoncaux #1	10,270	37.0	2/86
Texaco	Immiscible CO_2	West Nancy	La.	731	Smackover	13,800	38.2	6/86
Texaco	Immiscible CO_2	Leeville	La.	17	7,900-Foot	7,200	36.1	4/86
Texaco	Immiscible CO_2	Caillou Island	La.	95	15,300-Foot	14,000	31.7	4/86
Texaco	Immiscible CO_2	Caillou Isand	La.	103	Upper 70	12,900	33.6	5/86
Texaco	Immiscible CO_2	Caillou Isand	La.	300	Middle 70	12,800	33.5	5/86
Texaco	Immiscible CO_2	Paradis	La.	1,500	Main Pay	9,800	35.0	6/86
Unocal	Polymer	Brown	Tex.	1,900	Glorieta	6,000	32.5	1/87
Unocal	Polymer	Beaver Creek	Michigan	3,560	Richfield	4,300	43	1/1/86
Unocal	Polymer	SCCBSU	Montana	6,400	Cut Bank	2,900	38	1986
Unocal	Steam	Brea	Calif.	150	Pliocene	2,500	16	Mid 1986
Unocal	Steam	Oakridge	Calif.	541	Miocene	2,600	21	Mid 1986
Unocal	Steam	Cymric	Calif.	150	Antelope Shale	2,400	13	1/86
Unocal	Steam	Midway-Sunset	Calif.	80	Tulare	1,900	14	1/15/86
M. H. Whittier Corp.	Steam	Coalinga	Calif.	80	Temblor	1,200±	13	9/85

Worldwide projects planned

Table B

Country/state	Operator	Type project	Field	Size, acres	Pay zone	Depth, ft	Gravity, °API	Target date
Canada/Alta.	Chevron Canada	Polymer	Taber	480	Mannville	3,200	18	10/86
Canada/Alta.	Chevron Canada	HC Misc.	Acheson	1,200	D3A	5,100	35	6/87
Canada/Alta.	Chevron Canada	HC Misc.	Mitsue	17,000	Gilwood	5,000	41	5/86
Canada/Alta.	Chevron Canada	HC Misc.	Mitsue	13,000	Gilwood	5,000	41	5/87
Canada/Alta.	Chevron Canada	HC Misc.	Kaybob BHLA	16,000	Beaver Hill Lake	10,000	36	9/87
Canada/Alta.	Westergrowth	Immiscible CO_2	Little Bow	960	Glauconite	3,500	25	1986
Canada/Alta.	Vikor	Miscible CO_2	Joffre	3,500	Viking	5,000	42	1986
Canada/Alta.	Mobil	Steam	Cold Lake	160	Grand Rapids	1,200	11	Late 1987
Canada/Sask.	Mobil	Steam	Celtic	160	Gen. Petroleum	1,650	12	1987
Canada/Sask.	Mobil	Steam	Celtic	320	Waseca	1,500	13	1987-88
Canada/Alta.	—	Steam	Manatoken	120	Lower Grand Rapids "B"	1,204	10.5	1986
Canada/Alta.	—	Steam	Lindbergh	—	Lower Grand Rapids "B"	1,607	11.0	1987
Canada/Alta.	—	Combustion	Morgan	40	Lloydminster	1,870	12	1986
Canada/Sask.	Saskoil	Combustion	Senlac	20	Lloyd	2,600	15	11/86
Canada/Sask.	Aberford Resources Ltd.	Polymer	Rapdan Unit	440	Upper Shaunavon	4,500	23	1-1-86
Canada/Alta.	Texaco Canada Resources	Steam	Frog Lake test	Single well	McLaren	1,480	10-13	1986
Canada/Alta.	Texaco Canada Resources	Steam	Frog Lake	Single well test	Waseca	1,560	10-13	1986
Canada/Alta.	Texaco Canada Resources	Steam	Frog Lake	Single well test	Dina	1,890	10-13	1986
Canada/Alta.	Texaco Canada Resources	Steam	Hanging Stone	Single well test	McMurray	1,000	N/A	1986
Canada/Alberta	Shell Canada Ltd.	CO_2 misc.	Manyberries	1,680	Cretaceous	3,400	38	1987
Canada/Alberta	Shell Canada Ltd.	HC misc.	Simonette	320	LeDuc D-3	12,000	48	1986
Canada/Alberta	Shell Canada Ltd.	HC misc.	Virginia Hills	6,080	Beaverhill Lake	9,200	38	1987
Canada/Alberta	Shell Canada Ltd.	CO_2 misc.	Harmatton East	2,000	Rundil	9,000	38	1987
Germany (Lower Saxony)	Wintershall AG	Steam	Emlichheim	41.5	Valenginian	2,460	24.5	1987
Germany (Lower Saxony)	Wintershall AG	Steam	Emlichheim	70.0	Valenginian	2,550	24.5	1987
Germany (Lower Saxony)	Wintershall AG	Steam	Emlichheim	28.5	Valenginian	2,460	24.5	1987
Germany (Lower Saxony)	Wintershall AG	Steam	Emlichheim	64.0	Valenginian	2,550	24.5	1987
Indonesia	Total	Micellar-Polymer	Handil	4	—	4,500	33	Early 1987
Italy	Agip S.p.A.	Steam	Tocco Casauria	5	Tocco	500	18-25	1986
Trinidad	Trintoc	Steam	Area IV	32	Cruise 'E'	1,800	18.0	1/86
Trinidad	Trintoc	Steam	Parrylands Expansion	30.0	Forest	1,100	11.5	10/86

EOR efforts in Canada

Operator	Field	Province	Type project	Start date	Area, acres	Number wells Prod.	Number wells Inj.	Pay zone	Formation type	Porosity, %	Permeability, md.	Depth, ft
Amoco	Bigoray "B" Pool	Alta.	HC miscible	1980	480	3	1	Nisku D-2	LS	5	130	7,500
Amoco	Rainbow	Alta.	HC miscible	1972	640	4	2	Keg River L.S.	LS	5	163	6,300
Amoco	South Swan Hills	Alta.	HC miscible	1973	28,480	164	47	Beaverhill Lake	LS	8	49	8,500
Amoco	Elk Point	Alta.	Steam	1983	—	—	—	L. Cummings	—	30	5,000	2,000
Amoco	Ante Creek	Alta.	HC miscible	1968	6,080	14	6	Beaverhill Lake	LS	6	9	11,000
BP	Wolf Lake	Alta.	Steam	3/8/85	524	187	187	Clearwater	S	31	3,000	1,398
BP	Phase A Pilot	Alta.	Combustion	1976	40	18	6	Clearwater	S	30	3,000	1,476
BP	Wolf Lake	Alta.	Steam	10/82	—	1	1	Lower Grand Rapids	S	33	3,000	1,400
BP	Wolf Lake	Alta.	Steam	1985	—	2	2	Lower Grand Rapids	S	33	3,000	1,330
Chevron Canada	W. Pembina Nisku A	Alta.	HC Misc.	8/81	160	1	1	Nisku	LS	10	207	9,500
Chevron Canada	W. Pembina Nisku D	Alta.	HC Misc.	5/81	160	1	1	Nisku	LS	10	240	10,200
Chevron Canada	Pembina Nisku A	Alta.	HC Misc.	7/85	306	1	1	Nisku	LS	7.6	708	10,000
Chevron Canada	W. Pembina Nisku C	Alta.	HC Misc.	4/84	148	1	1	Nisku	LS	6.1	1,100	9,800
Chevron Canada	Brazeau River Nisku B	Alta.	HC Misc.	9/84	227	1	1	Nisku	LS	6.3	283	9,960
Chevron Canada	Pembina Nisku D	Alta.	HC Misc.	11/85	790	3	1	Nisku	LS	12.3	1,875	8,400
Chevron Canada	Bigoray Nisku F	Alta.	HC Misc.	3/86	—	1	1	Nisku	LS	11	3,866	7,800
Chevron Canada	Mitsue	Alta.	HC Misc.	5/85	17,280	71	27	Gilwood	S	13.4	282	5,000
Chevron Canada	Taber Mannville D Unit No. 2	Alta.	Polymer	3/74	1,160	23	6	Mannville	S	19.4	132	3,200
Husky	Beaverdam	—	Steam	12/85	240	—	—	Rex	S	33	3,000	1,400
Husky	Tengleflags	—	Combustion	2/85	1,120	19	3	General Petroleum	S	33	4,000	1,700
Husky	Golden Lake	Sask.	Combustion	1969	600	46	5	Sparky	Unconsolidated Sandstone	31	1,300	1,640
Husky	Pikes Peak	Sask.	Steam	1981	360	56	1	Waseca	Unconsolidated Sandstone	37	5,000-10,000	1,640
Husky	Westhazel	Sask.	Steam	1985	—	2	2	GP	S	33	5,000	1,575
Husky	Westhazel	Sask.	Steam	1985	—	2	2	GP	S	33	5,000	1,575
Husky	Cold Lake	Alta.	Steam	1983	—	12	12	Clearwater	S	33	4,000	1,500
Husky	Aberfeldy	Sask.	Steam	1979	160	56	15	Sparky	S	30	1,700	1,700
Husky	Frog Lake	Alta.	Steam	8/85	20	4	—	Colony	S	33	2,500	1,400
Husky	Morgan	Alta.	Steam	9/84	25	5	—	Lloyd	S	30	1,500	1,800
Husky	Golden Lake Waseca	Sask.	Combustion	10/82	200	17	2	Waseca	S	30	2,000	1,550

Table 2

Active U.S. EOR projects

	Number of projects								Change from 1984, %
	1971	1974	1976	1978	1980	1982	1984	1986	
Thermal									
Steam	53	64	85	99	133	118	133	181	+36.1
Combustion in situ	38	19	21	16	17	21	18	17	−5.6
Hot water	—	—	—	—	—	—	—	3	—
Total thermal	**91**	**83**	**106**	**115**	**150**	**139**	**151**	**201**	**+33.1**
Chemical									
Micellar-polymer	5	7	13	22	14	20	21	20	−4.8
Polymer	14	9	14	21	22	55	106	178	+67.9
Caustic	—	2	1	3	6	10	11	8	−27.3
Total chemical	**19**	**18**	**28**	**46**	**42**	**85**	**138**	**206**	**+49.3**
Gases									
Hydrocarbon miscible	21	12	15	15	9	12	16	26	+62.5
CO_2 miscible	1	6	9	14	17	28	40	38	−5.0
CO_2 immiscible	—	—	—	—	—	—	18	28	+55.6
Nitrogen	—	—	—	—	—	—	7	9	+28.6
Flue gas (miscible and immiscible)					8	10	3	3	—
Total gases	**—**	**—**	**—**	**—**	**34**	**50**	**84**	**104**	**+23.8**
Other									
Carbonated waterflood								1	—
Grand Total					**226**	**274**	**373**	**512**	**+37.3**

Table 3

Active U.S. EOR market share

	Total projects	Daily EOR production
Thermal	39.3	79.3
Chemical	40.3	2.8
Gases	20.4	17.9

couraged companies to position themselves toward low risk investment for additional long term crude oil reserves. EOR offers a viable alternative.

Creative thinking, rigorous research, and prudent judgment are the basic investments in EOR. But regardless of techniques or processes, any project must be justified on the basis of economic return on investment and acceptable risk.

Deteriorating economics and regulatory constraints may impede the rate at which new projects are implemented, but proved, mature projects with infrastructure largely in place will not be significantly affected insofar as productivity is concerned.

It is not improbable that EOR production in the U.S. will approximate 900,000 b/d by 1990 based on reasonable assumptions which include:

- Additional (new) projects will continue to come on stream as a part of long term strategy.
- Continuing higher productivity as ongoing successful projects mature.
- Advancing technology of fluid chemistry and additives.
- Advancing technology of computer hardware and software for reservoir modeling and monitoring of project performance.

Table C

Reservoir oil				Residual oil saturation, %						
°API	cp	@ °F.	Previous prod.	Start	End	Project maturity	Total prod., bo/d	Enhanced prod., bo/d	Project eval.	Profit
40	1.0	160	Prim.	78	—	JS	1,550	1,550	Succ.	—
41	0.4	180	Pres. Maint.	85	—	HF	2,510	2,510	Succ.	—
38	0.4	225	Prim./WF	35	—	HF	26,160	26,160	Succ.	—
11	—	75	Prim.	—	—	JS	5,000	—	Prom.	—
40	0.14	233	Prim.	90	—	HF	1,340	1,340	Succ.	—
10	10,000	60	—	65	—	JS	6,920	—	Succ.	Yes
10	10,000	60	—	65	—	HF	—	—	Succ.	No
10	45,000	60	—	78	—	NC	—	—	Succ.	No.
10	45,000	60	—	75	—	JS	—	—	TETT	No
47	0.25	228	Prim.	90	25	HF	3,700	1,700	Prom.	Yes
46	0.18	218	Prim.	89	30	HF	2,866	1,230	Prom.	Yes
44	0.34	210	WF	68	30	JS	3,700	1,000	TETT	Yes
42	0.7	218	WF	77	20	JS	5,956	2,160	TETT	Yes
47	0.5	212	WF	78	20	JS	3,425	1,200	TETT	Yes
37	0.86	176	WF	68	25	JS	6,434	1,700	TETT	Yes
36.5	1	175	—	65	22	JS	3,960	1,150	TETT	Yes
41	0.65	147	WF	30	19	JS	6,300	700	TETT	Yes
18	50	95	Prim.	75	63	Termiol 35	300	300	Disc.	—
—	—	70	—	80	—	JS	—	—	TETT	TETT
14.5	4,000	74	Prim.	77	—	JS	—	—	Prom.	—
12-13	3,500	70	—	21	14	NC	620	620	Prom.	No
12	15,000	70	—	32	23	HF	3,700	3,700	Succ.	Yes
13.6	11,000	70	Prim.	82	—	JS	60	60	TETT	—
13.6	11,000	70	Prim.	82	—	JS	60	60	TETT	—
10.2	130,000	60	—	65	—	JS	400	400	Prom.	—
17	—	—	Prim/WF	71	43	HF	1,200	1,200	Prom.	No
12	100,000	60	—	80	65	JS	60	60	TETT	TETT
12	120,000	70	—	75	60	JS	125	125	Prom.	—
16.5	1,300	70	Prim.	75	70	NC	—	—	Prom.	No

EOR efforts in Canada .... continued

Operator	Field	Province	Type project	Start date	Area, acres	Number wells Prod.	Inj.	Pay zone	Formation type	Porosity, %	Permeability, md.	Depth, ft
Murphy	Evehill	Sask.	Steam	9/81	180	16	9	Cummings Waseca	S	34	6,000	2,450
Murphy	Cold Lake	Alta	Steam	8/74	20	17	—	Lower Grand	S	33	2,500	1,620
Norcen	Provost	—	Steam	1985	20	9	—	McLaren	S	27-30	4,000	2,430
Norcen	Provost	—	Combustion	1975	105	24	7	McLaren	S	29	4,000	2,450
Pancanadian	Countess Upper Mannville "B" Pool	Alta.	Combustion	1/83	40	4	2	Glauconite S.S.	S	25	800	3,550
Pancanadian	Horsefly Lake	Alta.	Polymer	10/83	40	5	4	Lower Mannville	S	20	100	3,200
Petro-Canada	Caroline	Alta.	HC Miscible	9-84	12,620	26	11	Cardium	S	10	12	8,200
Petro-Canada	Athabasca	Alta.	Steam	10/85	--	1	1	McMurray	S	32	1,350	850
Petro-Canada	Athabasca	Alta.	Steam	12/84	—	1	1	McMurray	S	32	1,350	850
Mobil	Celtic	Sask.	Cyclic Steam Injection	4/85	23	5	—	General Petro.	S	35	2,000	1,576
Mobil	Celtic	Sask.	Cyclic Steam Injection	10/80	125	20	5	Waseca	S	35	1,000	1,500
Mobil	Kitscoty	Alberta	Combustion	1977	1,040	82	9	Sparky	S	34	2,000	1,800
Mobil	Silverdale	Alberta	Combustion	1977	1,280	73	18	Sparky	S	31	2,000	1,900
Mobil	Fosterton Northwest	Sask.	Combustion	3/77	200	6	2	Roseray	S	29	958	3,100
Mobil	Battrum Field	Sask.	Combustion	10/66	4,720	87	5	Battrum/Roseray	S	26	1,265	2,900
Mobil	Battrum Field	Sask.	Combustion	11/65	680	13	2	Roseray	S	27	930	2,900
Mobil	Battrum Field	Sask.	Combustion	8/67	2,080	26	2	Battrum & Roseray	S	25	930	2,900
Mobil	Rainbow	—	Hydrocarbon Miscible	9/72	360	9	3	Keg River	Dolo/LS	8.6	7,000	500
Mobil	Rainbow	—	Hydro. Misc.	7/83	110	4	1	Keg River	Dolo/LS	9.8	1,000-4,000	1,200
Mobil	Cold Lake	Alberta	Steam	1982	—	—	—	Lower Grand Rapids	S	35	1,000	1,200
Shell Canada Ltd.	Midale	Sask.	Co$_2$ Misc.	10/85	5	3	4	Midale	LS/dol	16	3	4,600
Petro-Canada	Brazeau River	Alta.	HC miscible	9/80	640	2	1	Nisku	LS	10	396	10,215
Petro-Canada	Brazeau River	Alta.	HC miscible	11/80	640	2	1	Nisku	LS	10	35	10,544
Petro-Canada	Brazeau River	Alta.	HC miscible	9/81	640	3	1	Nisku	LS	7	50	10,091
Texaco-Canada	Wizard Lake	Alta.	HC miscible	1969	3,725	43	12	Leduc D-3A	Dolo.	9.55	1,375	6,500
Texaco-Canada	Pembina 'G' Pool	Alta.	HC miscible	1981	328	3	1	Nisku	Dolo.	8.2	900	9,439
Texaco-Canada	Pembina 'K' Pool	Alta.	HC miscible	1980	143	2	1	Nisku	Dolo.	10.4	2,020	9,500
Texaco-Canada	Pembina 'L' Pool	Alta.	HC miscible	1985	376	4	2	Nisku	Dolo.	11	1,060	9,410
Texaco-Canada	Pembina 'M' Pool	Alta.	HC miscible	1983	475	2	1	Nisku	Dolo.	8.9	540	9,350
Texaco-Canada	Pembina 'O' Pool	Alta.	HC miscible	1983	210	1	1	Nisku	Dolo.	11.6	3,100	9,236
Texaco-Canada	Pembina 'P' Pool	Alta.	HC miscible	1983	370	3	1	Nisku	Dolo.	10.6	2,400	9,432
Texaco-Canada	Pembina 'Q' Pool	Alta.	HC miscible	1985	316	2	1	Nisku	Dolo.	9	1,970	9,463
Texaco-Canada	Lone Rock	Sask.	Steam	11/84	45	13	3	Sparky	S	34.4	2,800	1,900
Texaco-Canada	Ft. McMurray	Alta.	Steam	1973	10	12	5	Wabiskaw-McMurray	S	32-35	2,000-3,000	250
Texaco-Canada	Ft. McMurray	Alta.	Steam	1976	3.75	6	7	Wabiskaw-McMurray	S	32-35	2,000-3,000	250
Texaco-Canada	Ft. McMurray	Alta.	Steam	1981	15.3	2	1	Wabiskaw-McMurray	S	25-35	2,000-3,000	250
Vikor	Joffre Viking	Alta.	CO$_2$ Miscible	6/1/83	320	6	6	Viking	S	13	500	4,900
Westgrowth Petroleum	Retlaw Mannville 'V' Pool	Alta.	CO$_2$ Miscible	11/1/83	2,800	25	7	Glauconite	S	18	50	2,800

Latin America activity

Country	State/Area	Operator	Field	Start date	Area, acres	Number wells Prod.	Inj.	Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
STEAM												
Trinidad	—	Trintoc	Point Fortin Central	5/85	30	6	—	Forest	S	30.0	500.0	1,000-1,200
Trinidad	—	Trintoc	Point Fortin Central	7/82	30	12	6	Forest	S	30	600	1,000-1,200
Trinidad	—	Trintoc	Forest Reserve	7/77	133	70	16	Forest Sand	S	33	200	1,000
Venezuela	Zulia	Maraven S.A.	East Tia Juana	1/11/74	1,830	135	21	L.L.	S	38.1	780	1,597
Venezuela	Zulia	Maraven S.A.	Main Tia Juana	6/68	141	15	7	L.L.	S	33	N.D.	1,250
Venezuela	Zulia	Maraven S.A.	Main Tia Juana	10/63	873	82	—	L.L.	S	38.1	N.D.	1,750
Venezuela	Zulia	Maraven S.A.	Main Tia Juana	6/66	141	15	—	L.L.	S	38.1	N.D.	1,250
Venezuela	Zulia	Maraven S.A.	Main Tia Juana	10/67	222	197	—	L.L.	S	38.1	750	1,746
Venezuela	Zulia	Maraven S.A.	Main Tia Juana	7/67	1,500	134	—	L.L.	S	38.1	750	1,400
Venezuela	Zulia	Maraven S.A.	Main Tia Juana	7/67	1,271	114	—	L.L.	S	38.1	675	1,220
Venezuela	Zulia	Maraven S.A.	East Tia Juana	9/64	415	36	—	L.L.	S	38.1	3,000	1,250
Venezuela	Zulia	Maraven S.A.	East Tia Juana	4/59	339	33	—	L.L.	S	38.1	N.D.	1,500
Venezuela	Zulia	Maraven S.A.	East Tia Juana	5/68	2,667	232	—	L.L.	S	38.1	N.D.	1,200
Venezuela	Zulia	Maraven S.A.	East Tia Juana	8/68	2,629	224	—	L.L.	S	38.1	N.D.	1,000
Venezuela	Zulia	Maraven S.A.	East Tia Juana	3/69	1,773	145	—	L.L.	S	38.1	N.D.	1,700
Venezuela	Zulia	Maraven S.A.	East Tia Juana	12/68	1,956	168	—	L.L.	S	38.1	N.D.	1,250
Venezuela	Zulia	Maraven S.A.	East Tia Juana	2/61	36	7	—	L.L.	S	38	N.D.	1,000
Venezuela	Zulia	Maraven S.A.	East Tia Juana	8/69	415	24	—	L.L.	S	38.1	N.D.	850
Venezuela	Zulia	Maraven S.A.	East Tia Juana	8/69	1,642	131	—	L.L.	S	38.1	N.D.	1,250
Venezuela	Zulia	Maraven S.A.	Lagunillas	11/79	3,101	267	—	L.L.	S	33.7	N.D.	2,615
Venezuela	Zulia	Maraven S.A.	Lagunillas	1/70	3,025	147	—	L.L.	S	33.7	N.D.	2,500
Venezuela	Zulia	Maraven S.A.	Lagunillas	1/70	76	7	—	L.L.	S	33.7	N.D.	2,600
Venezuela	Zulia	Maraven S.A.	Lagunillas	4/65	420	59	—	U.L.H.	S	35	N.D.	2,100
Venezuela	Zulia	Maraven S.A.	Lagunillas	7/67	618	54	—	U.L.H.	S	35	N.D.	2,100
Venezuela	Zulia	Maraven S.A.	Lagunillas	8/70	2,114	175	—	U.L.H.	S	35	N.D.	1,725
Venezuela	Zulia	Maraven S.A.	Lagunillas	4/70	2,565	220	—	U.L.H.	S	35	N.D.	1,750
Venezuela	Zulia	Maraven S.A.	Lagunillas	11/80	3,565	299	—	U.L.H.	S	35	N.D.	2,398
Venezuela	Zulia	Maraven S.A.	Bachaquero	8/70	76.7	7	—	Post-Eoceno	S	34.3	N.D.	2,125
Venezuela	Zulia	Maraven S.A.	Bachaquero	8/70	76	7	—	Post-Eoceno	S	34.3	N.D.	1,864
Venezuela	Zulia	Maraven S.A.	Bachaquero	11/66	168	15	—	Post-Eoceno	S	35	500	3,200
Venezuela	Zulia	Maraven S.A.	Bachaquero	10/84	7,795	539	—	Post-Eoceno	S	37.3	N.D.	2,000
Venezuela	Zulia	Maraven S.A.	East Tia Juana	4/59	339	33	—	L.L.	S	38	N.D.	1,500
Trinidad	Trinidad & Tobago	Trintoc	Forest Reserve	8/76	58	4	1	Forest Sand	S	31	205	3,000
Trinidad	Trinidad & Tobago	Trintoc	Forest Reserve	1/74	29	2	1	Forest Sand	S	30	150	2,600

Reservoir oil				Residual oil saturation, %						
°API	cp	@°F.	Previous prod.	Start	End	Project maturity	Total prod., bo/d	Enhanced prod., bo/d	Project eval.	Profit
14.3	2,750	70	Prim.	100	80	JS	—	—	—	—
10	100,000	70	None	100	80	JS	600	600	Prom.	No
12	2,000	80	Prim.	82	45	JS	400	—	TETT	Yes
12	2,000	80	Prim.	80	55	HF	300	300	Disc.	No
28	6	100	WF	50	35	JS	—	—		—
23	50	94	WF	45	21	JS	—	—		—
46	0.25	173	Prim.	85	45	JS	1,250	450	—	Yes
8.8	800,000	55	—	83	—	JS	—	—	TETT	TETT
8.8	800,000	55	—	83	—	JS	—	—	Succ.	—
13	7,000	67	Prim.	69	46	JS	290	290	Prom.	—
13	5,380	61	Prim.	70	47	HF	630	630	Prom.	—
12.2	15,000	70	Prim.	85	60-68	HF	650	300-350	Disc.	—
15.6	1,800	70	Prim.	86	60-68	HF	550	250-300	Disc.	—
24	16	125	WF	62	—	HF	170	170	Prom.	—
18	70.3	110	Prim.	66	—	HF	2,500	2,500	Succ.	—
18	70	110	Prim.	66	—	HF	760	760	Succ.	—
18	70	110	Prim.	62	—	HF	1,070	1,070	Succ.	—
36	0.465	184	Gas/WF	0.82	0.28	HF	1,079	420	Prom.	Yes
35.9	0.455	190	WF	0.40	0.23	JS	647	446	Prom.	Yes
10-12	20,000-10,000	60	—	65	50	HF	400-500	400-500	Prom.	—
28	3	150	Prim & WF	30	—	JS	—	—	—	—
44	0.4	218	Prim.	90	10	HF	7,397	7,397	Succ.	Yes
46	0.2	222	Prim.	90	15	HF	420	420	Succ.	Yes
42	0.38	216	Prim.	90	15	HF	524	524	TETT	Yes
38	0.875	167	Prim.	93	3.8	HF	28,000	28,000	Succ.	Yes
44	0.33	204	Prim.	97	30	JS	2,800	1,200	Prom.	Yes
45	0.37	194	Prim	97	30	JS	2,400	1,065	Prom.	Yes
41.6	0.42	199	WF	88	—	JS	4,200	1,500	TETT	TETT
40	0.14	198	Prim.	0.91	—	JS	2,900	1,220	Prom.	Yes
38	0.32	195	Prim	88.3	25.2	JS	1,600	640	Prom.	Yes
40	0.36	200	Prim.	90.9	19	JS	4,000	1,775	Prom.	Yes
37	[illegible]	196	Prim.	92	—	JS	1,600	855	TETT	Yes
16	80[illegible]	76	Prim.	82	NA	JS	—	—	TETT	TETT
7-9	—	42	—	70-80	—	Term 9/85	—	—	—	—
7-9	—	42	—	70-80	—	Term 9/85	—	—	—	—
7-9	—	42	—	70-80	—	HF	—	—	—	—
42	1.14	133	WF	38	22	HF	—	—	Prom.	—
23	10	95	Prim.	75	50	—	—	—	Succ.	Yes

Table D

Reservoir oil				Residual oil saturation, %						
°API	cp	@°F.	Previous prod.	Start	End	Project maturity	Total prod., bo/d	Enhanced prod., bo/d	Project eval.	Profit
11	5,000	100	—	75	15	JS	260	260	Prom	—
11	5,000	100	—	75	15	JS	410	410	Prom	Yes
15.7	95	100	Prim/Cyclic Steam	—	—	NC	1,500	1,500	Succ.	Yes
12	1,000	111	—	81	56	HF	22,400	20,000	Prom.	Yes
13.1	1,000	113	Prim.	88	68	—	7,500	6,600	Prom.	Yes
13.1	750	113	—	86	74	NC	1,976	592	Prom.	Yes
13.1	1,300	104	Prim.	92	78	NC	2,159	60	Prom.	Yes
13.1	4,100	110	Prim.	95.1	80.9	HF	10,451	8,712	Prom.	Yes
11.8	1,000	110	Prim.	91.1	76	HF	5,305	3,351	Prom.	Yes
13.1	6,000	123	Prim.	94.3	80.8	HF	5,960	4 879	Prom	Yes
12	3,000	104	Prim.	95.6	78.6	HF	1,378	1,137	Prom	Yes
12.2	1,000	108	Prim.	92.6	72.3	HF	810	534	Prom.	Yes
12	500	104	—	93.6	82.5	HF	8,400	6,324	Prom.	Yes
11.6	4,000	104	Prim.	94.6	79.6	HF	9,274	7,716	Prom.	Yes
11.9	2,000	111	Prim.	92.7	74.5	HF	5,633	3,975	Prom.	Yes
11.7	7,500	106	Prim.	97.5	82.5	HF	10,666	9,783	Prom.	Yes
9.5	12,000	105	Prim.	100	76.9	NC	130	130	Prom.	Yes
10.5	10,000	95	Prim.	99.9	84.6	HF	1,444	1,444	Prom.	Yes
10.2	12,000	102	Prim.	99.9	89.9	HF	12,206	12,206	Prom.	Yes
15	580	[illegible]	Prim.	83.3	68.8	HF	12,464	5,762	Prom.	Yes
15.2	500-4,500	12[illegible]	Prim.	86	74.3	HF	5,357	2,129	Prom.	Yes
15.2	250	125	Prim.	73.7	63.5	NC	206	168	Succ.	Yes
11.4	3,500	117	Prim.	96.9	58.7	NC	3,136	1,076	Succ.	Yes
11.4	3,500	117	Prim.	9	7	NC	4,452	825	Succ.	Yes
11.4	4,000-9000	118	Prim.	97.8	—	HF	9,465	4,632	Prom.	Yes
11.8	2,500-11,500	115	—	97.3	89.4	HF	21,860	4,822	Prom.	Yes
11	2,000-3,700	125	Prim.	90.6	77.9	HF	32,348	6,625	Prom.	Yes
13.8	600	118	Prim.	79.8	62.2	Term 8/74	298	100	Succ.	Yes
13.4	700	115	Prim.	76.4	55.8	Term 8/73	356	110	Succ.	Yes
13	150	130	Prim.	86.2	68.6	Term 11/70	465	251	Succ.	Yes
13	300-800	117	Prim.	85	—	JS	107,000	48,000	Prom.	Yes
12	1,000	108	—	—	—	HF	810	534	Prom.	Yes
19	32	120	Prim.	57	45	HF	100	100	Prom.	—
19	90	102	Prim.	66	50	HF	75	75	Prom.	—

Other foreign activity

Country	Type project	Operator	Field	Start date	Area, acres	– Number wells – Prod.	Inj.	Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
Congo	Steam	Elf Congo	Emeraude-Offshore	1985	9	8	2	Senonian	S	25	80	600
France	Steam	Total CFP	Marienbronn	1983	23	19	6	Oligocene	S	10-25	1,200	826
France	Micellar-polymer	Elf Aquitaine	Chateaurenard	1984	71	9	4	Neocomien	S	30	1,300	1,950
France	Steam	Elf Aquitaine	Lacq Superieur	1977	45	9	2	Senonien	LS	15	1	2,100
Germany, Lower Saxony	Polymer	Wintershall AG	Bockstedt	9/84	57	5	1	Valenginian	S	23	4,000	4,100
Germany, Lower Saxony	Steam	Wintershall AG	Emlichheim 06	5/81	121	25	4	Valenginian	S	30	6,000	2,400
Germany, Lower Saxony	Hot Water Flood	Wintershall AG	Emlichheim 15	1/67	115	15	2	Valenginian	S	30	6,000	2,300
Germany, Lower Saxony	Hot Water Flood	Wintershall AG	Emlichheim 17	10/74	81.5	10	2	Valenginian	S	30	6,000	2,300
Germany, Lower Saxony	Hot Water Flood	Wintershall AG	Emlichheim 07	10/67	81.5	10	1	Valenginian	S	30	6,000	2,400
Germany Lower Saxony	Hot Water Flood	Wintershall AG	Emlichheim 10	11/81	41.5	6	1	Valenginian	S	30	6,000	2,460
Germany, Lower Saxony	Hot Water Flood	Wintershall AG	Emlichheim 11	9/73	70	8	2	Valenginian	S	30	6,000	2,550
Germany, Lower Saxony	Hot Water Flood	Wintershall AG	Emlichheim 13	5/71	28.5	4	1	Valenginian	S	30	6,000	2,460
Germany, Lower Saxony	Hot Water Flood	Wintershall AG	Emlichheim14	10/67	64	8	1	Valenginian	S	30	6,000	2,550
Germany, Lower Saxony	Steam	Wintershall AG	Ruehlertwist	12/78	237	24	2	Valenginian	S	28	5,000	2,650
Germany, Northwest	Polymer	Preussag AG	Edesse-Nord	11/85	4.2	1	2	Weladen	S	24	1,200	1,200
Germany	Polymer	Texaco AG	Hankensbuettel Westblock 2	5/79	—	6	3	Upper Dogger-Beta	S	28	2,000-4,000	4,900
Germany	Surfactant	Texaco AG	Hankensbuettel Westblock 4	1982	83	7	3	Lower Dogger-Beta,	S	28	300-1,000	4,900 4,900
Germany	Polymer	Texaco AG	OERREL Westblock 4	1980	410	13	3	Upper Dogger-Beta	S	28	2,000-4,000	4,900
Germany	Polymer	Texaco AG	Hankensbuettel Westblock 4	4/77	165	7	2	Upper Dogger-Beta	S	28 4,000-	2,000-	4,900
Italy	CO_2 Huff and Puff	Agip S.p.A.	Pisticci	10/85	50	—	—	Cupello	LS	5	1,000	6,500
Italy	Steam	Agip S.p.A.	Vallecupa	9/84	33	4	1	Orte	Marie	4	100	1,980
Italy	CO_2 immiscible	Agip S.p.A.	Ponte Dirillo	12/83	1,853	4	1	Taormina	Dolo.	7.5	200	9,700
Indonesia	Micellar polymer	Total	Handil	82	4	1	3	—	S	30	1,000	4,500

Steam EOR still leads in U.S.

Operator	Field	State	County	Start date	Area, acres	Number wells Prod.	Inj.	Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
Arco	Midway-Sunset	Calif.	Kern	1/72	7.8	21	2	Potter	S	32	1,675	1,200
Arco	Midway-Sunset	Calif.	Kern	2/72	3.1	61	7	Potter	S	32	2,500	1,400
Arco	Midway-Sunset	Calif.	Kern	8/72	3.2	12	1	Reef Ridge	S	32	1,000	1,000
Arco	Kern Front	Calif.	Kern	9/19/77	4.8	9	1	Cnange	S	35	1,600	2,070
Arco	Midway-Sunset	Calif.	Kern	12/84	1.5	3	1	Fairfield Tar Sand	S	32	3,030	1,050
Angus Pet. Co.	Blackwell's Corner	Calif.	Kern	1/84	340	25	—	Agua	S	37	475	1,300
Champlin	Wilmington	Calif.	Los Angeles	7/82	20	9	4	Tar	S	30.1	2,780	2,563
Chase	Oxnard	Calif.	Ventura	—	1,500	38	—	Vaca Sand	S	36	2,500	1,800
Chevron	Bradley Canyon	Calif.	Santa Barbara	4/82	40	16	8	Sisquoc	S	30	800	3,000
Chevron	Cymric, Sec. 31X	Calif.	Kern	4/79	61	34	22	Amnicola	S	35	2,700	1,300
Chevron	Cymric -36 W	Calif.	Kern	5/75	81	105	57	Tulare/Amnicola	S	33	1,800	1,200
Chevron	Kern River Sec. 4	Calif.	Kern	6/78	156	177	62	Kern River	S	34	—	850
Chevron	McKittrick 9Z	Calif.	Kern	8/78	80	32	16	Amnicola	S	38	2,700	1,300
Chevron	McKittrick 21Z	Calif.	Kern	—	—	—	—	—	—	—	—	—
Chevron	Kern River MC1	Calif.	Kern	4/76	132	130	62	Kern River	S	34	2,800	960
Chevron	Kern River ANO	Calif.	Kern	5/74	160	102	57	Kern River	S	32	—	1,000
Chevron	Kern Front	Calif.	Kern	2/80	36	18	9	Chanac	S	29	1,000	2,500
Chevron	West Coalinga, 25-D	Calif.	Kern	2/80	36	18	9	Chanac	S	29	1,000	2,500
Chevron	West Coalinga 13-D	Calif.	Fresno	5/73	550	147	89	Temblor	S	35	1,000	1,200
Chevron	N. E. McKittrick 16-Z	Calif.	Kern	9/75	87	36	22	Amnicola	S	35	2,700	1,300
Chevron	Kern River KCL 39	Calif.	Kern	10/75	118	26	45	Kern River	S	33	—	1,400
Chevron	Midway-Sunset Sec. 26 C	Calif.	Kern	11/75	84	75	30	Monarch	S	32	1,100	1,300
Chevron	Midway-Sunsect. Sec. IF	Calif.	Kern	2/78	19	20	6	Upper 10-10	S	32	2,200	1,600
Chevron	Midway-Sunset Sec. 15A	Calif.	Kern	5/78	23	40	5	Potter	S	36	3,900	1,400
Chevron	Kern River Sec. 3	Calif.	Kern	9/68	424	271	108	Kern River	S	34	3,389	775
Chevron	Kern River MCII	Calif.	Kern	4/71	80	44	32	Kern River	S	34	2,800	960
Chevron	Edison 27-RT	Calif.	Kern	7/77	30	13	6	L Kern River	S	30	—	1,000
Chevron	Lost Hills	Calif.	Kern	3/85	16	9	4	A	S	40	2,500	850
Chevron	Cymric	Calif.	Kern	2/86	44	29	23	Tulare	S	33	2,900	1,200
Chevron	Lost Hills	Calif.	Kern	8/85	14	14	6	—	S	38	2,000	350
Chevron	Fruitvale	Calif.	Kern	5/77	860	122	0	Chanac	S	29	920	3,300
Chevron	Tejon-Grapevine	Calif.	Kern	12/78	40	8	0	Basal Chanac	—	30	2,160	2,600
Chevron	Lost Hills Sec. 32	Calif.	Kern	2/79	150	29	0	Etchegoin A	S	36	1,800	910
Chevron	Yorba Linda	Calif.	Kern	7/62	80	84	0	Shallow Tar	S	27	1,000	250-1,650
Chevron	Cymric	Calif.	Kern	5/66	26	19	0	Tar	S	32	1,200	700
Chevron	Kern Bluff	Calif.	Kern	7/66	214	52	0	Santa Margarita	S	29	2,000	950
Chevron	Lost Hills Sec. 18	Calif.	Kern	7/83	38	34	12	Tulare	S	38	2,100	300

Table E

°API	Reservoir oil cp	Reservoir oil @°F.	Previous prod.	Residual oil saturation, % Start	Residual oil saturation, % End	Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
22	100	85	Prim.	—	—	JS	—	—	TETT	—
11	23,000	68	—	80	—	Term. 8/17/85	59	59	Succ.	No
27	40	86	Prim./WF	60	31	HF	8,900	4,950	Prom.	No
22	20	150	Prim.	45	—	HF	1,100	250	Prom.	Yes
34	11	130	WF	39	33	JS	150	—	TETT	TETT
24.5	175	95	Hot Water Flood	62	45	NC	1,600	1,500	Succ.	Yes
24.5	175	95	WF	72	54	HF	240	235	Succ.	Yes
24.5	175	95	WF	66	55	HF	330	270	Succ.	Yes
24.5	175	95	WF	70	56	HF	170	165	Succ.	Yes
24.5	175	95	WF	70	68	HF	80	55	TETT	TETT
24.5	175	95	WF	72	68	NC	280	246	Succ.	Yes
24.5	175	95	WF	70	58	NC	92	88	Succ.	Yes
24.5	175	95	WF	73	58	NC	185	182	Succ.	Yes
25	175	100	Edge Water Drive	51	42	HF	1,200	1,100	Succ.	Yes
36	8	73	WF	53	37	JS	12.5	8	TETT	No
28	13	136	WF	72	42	NC	1,700	1,300	Succ.	Yes
27	11	136	WF	58	40	HF	100	30	TETT	TETT
25	17	136	WF	60	45	HF	540	400	Prom.	Yes
27	13	136	WF	69	43	NC	1,000	700	Succ.	Yes
11	23	153	Prim.	60	—	JS	800	—	TETT	TETT
16-26	13.4	80.6	Prim.	—	—	NC	—	—	Disc.	No
15.6	25	210	Prim.	83.5	—	HF	1,250	500	Prom.	Yes
33	0.4	115	WF	35	—	—	400	400	—	—

Table F

°API	Reservoir oil cp	Reservoir oil @°F.	Previous prod.	Residual oil saturation, % Start	Residual oil saturation, % End	Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
12	2,000	100	Steam Soak	—	—	HF	400	174	Succ.	Yes
14	1,500	100	WF	—	—	NC	943	299	Succ.	Yes
13	1,500	100	Steam Soak	—	—	HF	165	100	Succ.	Yes
13.9	1,270	105	Prim.	—	—	Term.	84	29	Disc.	Yes
14	1,500	95	Prim.	—	—	JS	40	33	TETT	TETT
13	4,000	100	Prim.	40	15	JS	—	600	TETT	Yes
14	283	123	WF	55	20	HF	500	500	Succ.	Yes
5.8	1.5 mil	100	—	100	66	JS	850	850	?	—
11	17,600	120	Prim.	90	40	JS	70	34	TETT	NO
12	3,000	1,000	Prim.	50	—	HF	1,274	1,274	Succ.	YES
13	4,000	100	—	52	—	HF	5,486	5,200	Succ.	YES
14	2,000	90	—	60	—	HF	5,389	5,069	Succ.	YES
13	4,000	100	Cyclic	47	—	HF	932	932	Succ.	YES
—	—	—	—	—	—	JS	184	184	PROM	—
14	2,000	90	—	59	—	HF	3,060	2,973	Succ.	YES
14	2,000	90	Prim.	55	—	HF	3,060	3,060	Succ.	YES
12	2,300	100	Prim.	50	12	HF	195	129	Disc.	NO
12	2,300	100	Prim.	50	12	HF	5,516	5,056	—	—
13	1,000	90	Prim.	46	15	HF	4,628	4,414	Succ.	YES
12	4,000	100	Cyclic	57	—	HF	1,229	1,229	Succ.	YES
14	2,000	90	—	65	—	HF	1,467	1,467	Succ.	YES
14	1,500	150	Cyclic	58	20	HF	6,951	6,296	Succ.	YES
14	1,500	105	Cyclic	55	15	NC	452	364	Disc.	—
14	900	120	Cyclic	61	20	NC	1,741	1,211	Succ.	YES
14	2,000	90	Prim.	55	—	HF	10,915	10,630	Succ.	YES
14	2,000	90	Prim.	59	—	HF	2,193	2,182	Succ.	YES
14	2,000	90	Prim.	50	—	HF	2,180	2,100	Succ.	YES
14	1,400	100	Cyclic	50	20	JS	157	107	TETT	YES
12	5,500	100	Cyclic	51	15	JS	2,400	2,050	TETT	TETT
12	4,600	90	Cyclic	55	20	JS	40	30	TETT	—
19	78	131	Prim.	71	—	HF	1,456	1,164	PROM	YES
16	167	115	Prim.	—	—	—	41	0	TETT	—
18	200	90	Prim.	72	—	HF	627	138	Succ.	YES
13	6,400	97	Prim.	95	—	NC	962	770	Succ.	YES
11	6,500	81	Prim.	99	—	NC	328	262	Succ.	YES
15	1,000	84	Prim.	74	—	NC	132	132	Succ.	YES
14	400	75	Cyclic	86	—	JS	1,160	1,160	Succ.	Yes

Steam EOR still leads in U.S. .... continued

Operator	Field	State	County	Start date	Area, acres	Number wells Prod.	Number wells Inj.	Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
Chevron	Lost Hills Sec. 30	Calif.	Kern	1/80	190	37	4	Etchegoin A	S	40	800	550
Chevron	Lost Hills Sec. 32	Calif.	Kern	4/77	120	30	4	Etchegoin Main	S	40	62	1,150
Cities Service	Kern Front	Calif.	Kern	11/81	342	120	—	Etchegoin Chanac	S	33	3,250	1,300-1,500
Drilling & Production	Midway-Sunset	Calif.	Kern	1965	160	34	20	Monarch	S	22	300	1,400
Elf Aquitaine	Poso Creek	Calif.	Kern	1980	50	35	19	Etchegoin	S	35	1,000	1,100
Elf Aquitaine	Poso McVan	Calif.	Kern	1980	120	32	19	Etchegoin	S	30-40	5,000	1,300
Exxon	Edison	Calif.	Kern	1965	1,100	—	—	Kern River	S	28	1,100	1,100
Phillips	Huntington Beach	Calif.	Orange	1/85	5.6	4	1	"AA"	S	32	1,000	1,600
Phillips	Huntington Beach	Calif.	Orange	12/83	5.6	2	1	TM	S	32	300	2,550
Phillips	Huntington Beach	Calif.	Orange	6/82	8.3	6	1	TM	S	32	850	2,300
Phillips	Huntington Beach	Calif.	Orange	10/81	3.5	5	1	TM	S	32	850	2,100
Phillips	Huntington Beach	Calif.	Orange	6/64	450	54	—	TM	S	32	850	2,100
Phillips	Smackover	Ark.	Ouachita	10/71	985	173	15	Nacatoch	S	35	2,000	1,920
Phillips	McCool Ranch	Calif.	Monterey	11/82	100	3	—	Lombardi	S	32	2,000	2,000
Phillips	Midway-Sunset	Calif.	Kern	8/78	154	125	—	Reefridge & Monarch	S	29	1,432	1,220
Rio Petro	O'Connell Ranch Unit	N.M.	Guadalupe	8/2/81	1.2	5		O'Connell	S	20.5	250	350
Rio Petro	T-4 Ranch Unit	N.M.	Guadalupe	10/11	1.2 82	3	1	O'Connell	S	20.5	250	709
Marathon	Poso Creek	Calif.	Kern	10/82	309	26	26	Etchegoin Chanac	S	35	2,000	2,400
Mobil	San Ardo	Calif.	Monterey	6/68	230	93	17	Aurignac	S	34.5	3,000	2,300
Mobil	San Ardo	Calif.	Monterey	3/80	49	29	7	Lombardi	S	32.5	3,000	2,100
Mobil	North Midway-Sunset	Calif.	Kern	11/67	374	340	—	Potter	S	35	1,000	1,000
Mobil	Midway-Sunset	Calif.	Kern	10/70	400	82	—	Monarch	S	34	4,000	950
Mobil	South Belridge	Calif.	Kern	1965	1,655	71	—	Tulare	S	35	3,000	1,000
Mobil	South Belridge	Calif.	Kern	1969	1,100	400	145	Tulare	S	35	3,000	1,000
Mobil	Kern Front	Calif.	Kern	10/82	21	10	4	Etchegoin	S	37	1,000	1,800
Mobil	Kern Front	Calif.	Kern	5/74	480	90	—	Etchegoin	S	37	1,000	1,800
Mobil	Cymric, McKittrick Fee	Calif.	Kern	7/65	180	53-40	—	Welport Amnicola	S	35	3,000	500
Mobil	Edison	Calif.	Kern	12/81	100	15	—	Kern River	S	30	1,000	1,100
Santa Fe Energy	Midway-Sunset	Calif.	Kern	3/85	100	200	25	Potter	Unconsolidated sand	35	3,000	1,200
Santa Fe Energy	Midway-Sunset	Calif.	Kern	10/72	5	13	4	Potter	S	30	2,500	850
Santa Fe Energy	Midway-Sunset	Calif.	Kern	1964	480	480	—	Potter	Unconsolidated sand	35	3,000	1,200
Santa Fe Energy	Coalinga	Calif.	Fresno	11/84	15	12	6	Lower Temblor	S	30	100-300	1,450-1,550
Santa Fe Energy	Midway-Sunset	Calif.	Kern	10/75	33	42	14	Spellacy	S	30	2,250	550
Santa Fe Energy	Coalinga	Calif.	Fresno	3/79	15	12	6	Lower Temblor	S	30	100-300	1,650
Santa Fe Energy	Coalinga	Calif.	Fresno	4/84	24	30	9	Lower Temblor	S	30	500-3,000	1,400-1,600
Santa Fe Energy	Coalinga	Calif.	Fresno	7/79	16	14	4	Lower Temblor	S	30	500-3,000	1,300-1,500
Santa Fe Energy	Coalinga	Calif.	Fresno	5/79	18	12	6	Lower Temblor	S	31	500-3,000	850-1,500
Santa Fe Energy	Coalinga	Calif.	Fresno	12/82	180	86	25	Lower Temblor	S	30	800-1,600	1,500-1,800
Santa Fe Energy	Coalinga	Calif.	Fresno	9/78	15	12	6	Lower Temblor	S	30	800-1,600	1,700-1,800
Santa Fe Energy	Midway-Sunset	Calif.	Kern	1979	250	42	14	Spellacy	S	30	1,050-3440	400-700
Santa Fe Energy	Kern River	Calif.	Kern	1/80	180	140	65	Kern River	S	30	1,00-3,000	700
Santa Fe Energy	Midway-Sunset	Calif.	Kern	4/83	520	46	0	Basal Tulare	S	35	1,300	1,300
Santa Fe Energy	Midway-Sunset	Calif.	Kern	6/64	60	88	0	Potter	S	36	500-3,000	1,400
Santa Fe Energy	Midway-Sunset	Calif.	Kern	1980	6	13	4	Potter	S	30	1,500	1,000
Santa Fe Energy	Midway-Sunset	Calif.	Kern	1965	640	153	—	Potter	S	30	1,500	1,200
Santa Fe Energy	Midway-Sunset	Calif.	Kern	1983	160	180	—	Potter	S	30	1,000	1,200
Santa Fe Energy	Brea Olinda	Calif.	Orange	10/1/85	2.5	4	1	Anaheim	S	27	1,000	900
Shell	Yorba Linda	Calif.	Orange	1971	220	222	44	Upper Congolmerate	S	22	6,000	650
Shell	Poso Creek	Calif.	Kern	6/80	360	62	—	Etchegoin	S	—	—	2,500
Shell	Brea Olinda	Calif.	Orange	6/85	19	20	2	Middle A Sand	S	20	200	2,600
Shell	Mount Poso	Calif.	Kern	1971	2,500-3,000	325	30	Vedder	S	—	—	1,800
Shell	Midway-Sunset	Calif.	Kern	1983	405	154	16	Sub-Hoyt	S	—	—	1,080
Shell	Midway-Sunset	Calif.	Kern	1971-1984	375	490	50	Potter	S	—	—	1,200
Shell	Midway-Sunset	Calif.	Kern	1980	70	147	13	Monarch	S	—	—	1,300
Shell	McKittrick	Calif.	Kern	11/85	180	7	—	Tulare	S	—	—	500
Shell	Kern River	Calif.	Kern	1970	600	391	168	Kern River Series	S	—	—	300-850
Shell	Cymric	Calif.	Kern	10/85	85	17	—	Tulare	S	—	—	1,400
Shell	Coalinga	Calif.	Kern	1980	300	193	45	Temblor Zone I	S	—	—	1,000
Shell	Coalinga	Calif.	Fresno	1984	300	60	—	Temblor Zone II	S	—	—	1,800
Shell	Coalinga	Calif.	Fresno	1982	57	21	10	Temblor Zone II	S	—	—	1,800
Shell	Coalinga	Calif.	Fresno	1981	300	123	18	Temblor Zone II	S	—	—	1,600
Shell	Coalinga	Calif.	Fresno	8/84	240	85	12	Temblor Zone I	S	—	—	1,200
Shell	Cat Canyon (East)	Calif.	Santa Barbara	8/85	35	7	—	Brooks Sand	S	30	1,400	3,300
Shell	White Castle	La.	Iberville	8/76	44	8	2	U	S	35	3,000	1,100
Shell	White Castle	La.	Iberville	8/76	62	26	9	V type	S	35	3,000	1,400
Shell	Cat Canyon	Calif.	Santa Barbara	3/85	20	5	—	Basal Sisquoc	S	32	750	4,400
Shell	Casmalia	Calif.	Santa Barbara	1980	45	25	—	Monterey	Saliceous Shale	20	1-5	1,000
Shell	Belridge	Calif.	Kern	1961	2,880	3,000	900	Tulare	S	36	2,400	400-1,400
Shell	Arroyo Grande	Calif.	San Luis Obispo	9/84	208	—	—	M_2	S	31	300	200-500
Sun	Cymric	Calif.	Kern	1981	135	100+	4	Tulare	S	35	1,500	600-1,500

Reservoir oil				Residual oil saturation, %						
°API	cp	@°F.	Previous prod.	Start	End	Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
18	300	90	Prim.	—	—	HF	596	542	Prom.	—
20	50	100	Prim.	—	—	NC	138	96	—	—
14	1,525	95	Prim.	50	15	HF	1,500	1,445	Succ.	Yes
13	13.3	90	Prim.	—	—	ongoing	140	30	Prom	Yes
13	8,000	105	Prim.	20	—	HF	550	520	NE	No
16	310	95	Prim.	—	—	HF	1,000	1,000	Succ.	Yes
12	8,000	95	Prim.	45	20	HF	525	525	Succ.	Yes
16	150	125	Steam Soak	75.5	26.5	JS	150	70	TETT	TETT
16	800	130	Steam Soak	68.0	34.0	JS	25	12	TETT	TETT
130	1,000	12.0	Steam Soak	60.0	24.0	HF	140	90	Succ.	Yes
13	1,000	120	Steam Soak	51.0	20.4	NC	50	40	Pom.	Yes
13.0	1,000	120	Prim.	75.5	52.0	HF	900	700	Succ.	Yes
20	75	110	Prim.	71	50	NC	1,200	600	Succ.	Yes
10.5	12,000	105	Prim.	60	—	Term-1985	50	40	Disc.	No
13	2,000	100	Prim.	67	—	HF	2,300	2,200	Succ.	Yes
17	6,000	70	None	55	27.5	JS	0	0	TETT	No
17	6,000	65	None	50	25	JS	0	0	TETT	No
12.7	2,600	110	Prim.	90	89	HF	700	400	Succ.	Yes
12	300	130	Steam Soak	55	27	HF	2,300	2,300	Succ.	Yes
11	2,000	125	Steam Soak	55	27	JS	3,500	3,500	Succ.	Yes
12	2,000	100	Prim.	65	30	HF	5,300	5,300	Succ.	Yes
13	800	85	Prim.	95	81	HF	739	739	Succ.	Yes
14	1,600	95	Prim.	64	60	WC	900	700	Succ.	Yes
14	1,600	95	Prim.	60	35	HF	23,600	22,400	Succ.	Yes
14	800	100	Steam Soak	67	25	NC	200	150	NE	—
14	800	100	Prim.	86	67	NC	385	—	Succ.	Yes
13	1,500	95	Prim.	87.5	57.7	NC	285	285	Succ.	Yes
17	800	100	Prim.	87	33	JS	45	35	Succ.	Yes
11.5	10,000	80	Cyclic Steam	55	—	JS	3,400	0	Prom.	TETT
11	4,000	100	Cyclic	95	50	HF	—	—	—	—
11.5	10,000	80	Prim.	55	15	NC	8,000	7,000	Succ.	Yes
14.5	1,665	75	Prim.	35	—	JS	350	300	Prom.	Yes
12	6,500	90	Cyclic	100	40	HF	—	—	—	—
14.5	1,665	75	Prim.	35	—	Term.	250	200	Disc.	No
14	2,284	75	—	35	—	JS	410	400	Prom.	Yes
14	2,284	75	Prim.	35	—	NC	410	400	Succ.	Yes
14	2,284	75	Prim.	35	—	NC	—	475	Succ.	Yes
14.5	1,667	75	Prim.	35	—	JS	2,400	2,300	Succ.	Yes
14.5	1,667	75	Prim.	35	—	NC	390	350	Succ.	Yes
12	6,500	90	Prim.	59	38	NC	—	400	Succ.	Yes
13	—	85	Prim.	45	15	NC	3,800	3,000	Succ.	Yes
10.5	3,000	105	Prim.	50	45	JS	550	450	Succ.	Yes
11	3,000	110	Prim.	60	33	HF	1,950	1,730	Succ.	Yes
11	20,000	90	Steam Soak	60	33	Term.	166	127	Disc.	No
11	20,000	90	Prim.	60	33	HF	2,500	1,500	Succ.	Yes
11.5	20,000	90	Steam Soak	60	33	JS	3,900	2,000	Succ.	Yes
13	4,000	100	Prim.	55	30-	JS	100	70	Prom.	Yes
12	6,400	85	Steam Soak	66	21	NC	4,000	4,000	Succ.	Yes
12.5	600	110	Prim.	—	—	JS	700	400	TETT	JS
14	500	120	Steam Soak	49	30	JS	500	300	Prom.	No
16	27.7	110	Prim.	—	—	NC	18,000	17,800	Succ.	Yes
13	3,000	100	Prim.	—	—	JS	5,400	5,000	Succ.	Yes
11	8,000	95	Prim.	—	—	HF	14,500	14,500	Succ.	Yes
13	5,000	13	Steam Soak	—	—	HF	6,000	5,800	Succ.	Yes
12	10,000	100	None	—	—	JS	—	—	TETT	TETT
13	6,000	85	Prim.	—	—	HF	9,150	8,720	Succ.	Yes
13	2,000	100	Prim.	—	—	JS	25	0	Prom.	Yes
13	6,000	110	Prim.	—	—	HF	5,300	5,000	Succ.	Yes
18	150	100	Prim.	—	—	JS	600	500	TETT	TETT
12	700	100	Prim.	—	—	HF	700	500	Succ.	Yes
18	150	100	Steam Soak	—	—	HF	3,400	3,000	Succ.	Yes
13	2,000	95	Prim.	—	—	JS	1,800	1,630	Succ.	Yes
6-10	7,000	135	None	68	—	JS	0	0	TETT	No
16	145	88	Prim.	—	—	HF	530	530	Succ.	Yes
16	312	92	Prim.	—	—	HF	1,530	1,530	Succ.	Yes
10.8	2,896	130	Prim.	55	—	JS	60	30	TETT	No
8	10,000	100	Prim.	—	—	Term.	180	15	Disc.	No
13	1,900	95	Prim.	75	20	HF	89,700	89,000	Succ.	Yes
15	4,000	100	Prim.	63	55	JS	700	350	TETT	Yes
12	—	80	Prim.	—	—	HF	1,423	1,423	Succ.	Yes

Steam EOR still leads in U.S. .... continued

Operator	Field	State	County	Start date	Area, acres	Number wells		Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
						Prod.	Inj.					
Sun	Midway-Sunset Sec. 15	Calif.	Kern	5/64	80	126	3	Potter	S	35	3,000	1,200
Sun	Midway-Sunset	Calif.	Kern	8/65	40	116	—	Potter	S	35	3,000	1,700
Sun	Midway-Sunset	Calif.	Kern	3/64	106	211	7	Potter/Tulare	S	35	3,000	1,200
Sun	Midway-Sunset	Calif.	Kern	11/82	—	6	1	Tulare/Gusher	S	31	1,800	1,000-2,300
Sun	Midway-Sunset	Calif.	Kern	7/84	—	176	—	Potter	S	—	—	—
Sun	Midway-Sunset	Calif.	Kern	1/84	—	105	2	Potter/Marvic/Tulare	S	—	—	1,100
Sun	Midway-Sunset	Calif.	Kern	1/84	—	71	—	Potter	S	—	—	1,100
Sun	Midway-Sunset	Calif.	Kern	7/84	—	30	—	Potter	S	—	—	—
Sun	Midway-Sunset	Calif.	Kern	7/84	—	92	—	Potter	S	—	—	—
Tenneco	Kern River	Calif.	Kern	1972	50	66	29	Kern River Series	S	33	4,000	600-1,200
Tenneco	Kern River	Calif.	Kern	1970	70	63	23	Kern River Series	S	33	4,000	1,200
Tenneco	Poso Creek	Calif.	Kern	1968	154	14	—	Etchegoin	S	32	2,500	2,400
Tenneco	Midway-Sunset	Calif.	Kern	1969	50	100	—	Metson	S	30	3,000	1,100
Tenneco	Midway-Sunset	Calif.	Kern	1981	40	70	10	Monarch	S	30	3,000	1,200
Tenneco	Kern River	Calif.	Kern	9/72	40	34	15	Kern River Series	S	31	2,500	900
Texaco	Cat Canyon	Calif.	Santa Barbara	1965	300	12	—	S8-516	S	30	2,000	3,000
Texaco	Cat Canyon	Calif.	Santa Barbara	1964	1,700	92	—	S1B	S	31	3,000	2,300
Texaco	Cat Canyon	Calif.	Santa Barbara	1977	390	83	—	S1A-S6	S	31	1,400	2,500
Texaco	Cat Canyon	Calif.	Santa Barbara	4/82	30	20	12	S1B	S	35	4,500	2,300
Texaco	East Cat Canyon	Calif.	Santa Barbara	11/77	30	18	3	S16B-Thomas Sand	S	31.5	404-1,749	2,610
Texaco	Lost Hills	Calif.	Kern	1977	85	36	20	Tulare	S	38	2,000	200
Texaco	South Belridge	Calif.	Kern	1985	20	25	16	Tulare	S	37	2,700	950
Texaco	McKittrick	Calif.	Kern	1984	12	16	9	Tulare	S	35	2,800	1,000
Texaco	Midway-Sec. 35	Calif.	Kern	1977	20	28	12	Potter	S	35	2,000	1,600
Texaco	Midway-Sec 35	Calif.	Kern	1984	7.5	16	5	Potter	S	35	2,000	1,600
Texaco	San Ardo	Calif.	Monterey	1965	835	345	35	Aurignac	S	39	2,200	2,200
Texaco	San Ardo	Calif.	Monterey	7/84	80	37	4	Lombard	S	35	5,200	1,900
Texaco	Midway-Reward	Calif.	Kern	2/77	12	26	9	Potter	S	33	3,000	1,300
Texaco	Midway-Security	Calif.	Kern	11/77	30	43	20	Potter	S	33	5,000	950
Texaco	Lost Hills	Calif.	Kern	1977	75	70	24	Etchegoin	S	40	2,000	400
Texaco	Midway-North Midway	Calif.	Kern	11/81	40	61	16	Potter	S	30	3,400	1,000
Tenneco	Kern River	Calif.	Kern	6/78	38	30	13	Kern River Series	S	31	2,000	600
Tenneco	Midway-Sunset	Calif.	Kern	1985	25	17	3	U. Monarch	S	29	2,000	1,300
Tenneco	Midway-Sunset	Calif.	Kern	1984	15	10	—	Sub Lakeview	S	30	4,500	1,300
Tenneco	Midway-Sunset	Calif.	Kern	1983	25	13	3	L. Monarch	S	30	2,500	1,500
Tenneco	Midway-Sunset	Calif.	Kern	3/73	24	48	6	Potter	S	34	3,000	1,600
Tenneco	Midway-Sunset	Calif.	Kern	4/85	14	29	5	Potter	S	34	3,500	1,500
Tenneco	Midway-Sunset	Calif.	Kern	4/84	17	31	2	Potter	S	34	3,500	1,600
Texaco	Wilcox	Calif.	Kern	3/83	69	26	15	Basal Etchegoin	S	31	1,945	2,000
Texaco	La Barge	Wyo.	Sublette	10/81	20	8	4	Almy	S	25.0	100	850
Texaco	Humble	Tex.	Harris	11/81	11.8	3	1	Yegua-13	S	33	345	4,100
Texaco	Sour Lake	Tex.	Hardin	6/84	7	8	4	Miocene OB-4	S	35	900	1,600
Texaco	Sour Lake	Tex.	Hardin	3/85	8	12	4	Miocene OB-2	S	33.3	1,000 +	2,000
Texaco	Sour Lake	Tex.	Hardin	4/80	2,645	—	—	Miocene	S	25-36	1,600	400-2,700
Texaco	Sour Lake	Tex.	Hardin	4/82	1.5	5	2	Miocene OB-1	S	32	1,500	500
Texaco	Sour Lake	Tex.	Hardin	11/81	19.8	24	12	Miocene OB-1	S	35.5	1,436	1,000
Texaco	Midway-Santiago Creek	Calif.	Kern	12/83	9	11	4	Tulare	S	34	2,500	1,300
Texaco	Wilcox (Poso Creek)	Calif.	Kern	3/83	69	26	15	Basal Etchegoin	S	31	1,945	2,000
Texaco	Kern River	Calif.	Kern	8/62	5,070	4,753	1,797	Kern River Series	S	31	4,000	1,000
Thums/City of Long Beach	Wilmington	Calif.	Los Angeles	1978	193	23	8	Ranger	—	26	400	2,700
Unocal	South Tapo Canyon	Calif.	Ventura	12/82	65	9	—	4th Sespe	S	22	25	2,100
Unocal	Cymric	Calif.	Kern	1964	300	—	—	Tulare	S	35	1,000	1,100
Unocal	South Belridge	Calif.	Kern	3/85	167	5	5	Tulare	S	38	4,000	1,250
Unocal	North Belridge	Calif.	Kern	11/65	160	10	10	Tulare	S	38	2,500	800
Unocal	North Belridge	Calif.	Kern	8/64	35	11	11	Tulare	S	37	2,500	770
Unocal	Belridge	Calif.	Kern	10/64	50	17	17	Tulare	S	37	2,500	740
Unocal	McKittrick	Calif.	Kern	6/77	131	36	24	Amnicola	S	37	1,000-2,000	1,100
Unocal	McKittrick	Calif.	Kern	12/82	70	22	14	Amnicola	S	37	1,500	1,100
Unocal	McKittrick	Calif.	Kern	8/71	70	32	7	Tulare	S	37	1,000-2,000	1,200
Unocal	McKittrick	Calif.	Kern	8/83	17	20	8	Tulare	S	36	1,000-2,000	850
Unocal	Midway-Sunset	Calif.	Kern	6/77	39	48	31	Potter	S	24	1,500	1,000
Unocal	Midway-Sunset	Calif.	Kern	5/69	161	186	0	Potter	S	24	1,500	1,000
Unocal	Midway-Sunset	Calif.	Kern	1983	80.5	42	0	Tulare	Sand	31	1,146	700
Unocal	Midway-Sunset	Calif.	Kern	1-15-85	5.2	9	4	Potter	Sand	34.5	3,700	1,100
Unocal	Midway-Sunset	Calif.	Kern	1974	80.5	47	17	Potter	Sand	34.5	3,700	1,100
Unocal	Midway-Sunset	Calif.	Kern	1966	80.5	38	0	Potter	Sand	34.5	3,700	1,100
Unocal	Midway-Sunset	Calif.	Kern	1969	80	2	0	Tulare	S	.26	300	1,900
Unocal	Midway-Sunset	Calif.	Kern	1974	60	28	0	Tulare	S	30	578	1,800
Unocal	Santa Maria Valley	Calif.	Santa Barbara	3/81	260	18	0	Pt. Sal	S	27	100	1,900
Unocal	Gato Ridge	Calif.	Santa Barbara	1970	130	16	0	Sisquoc Sib & S_2	S	32	2,500	1,900
Unocal	Jesus Maria	Calif.	Santa Barbara	8/82	20	2	0	Monterey	Fractured Chert-Dolo	7.5	2.0	3,500
Unocal	Guadalupe	Calif.	San Luis	3/81	644	82	12	Sisquoc	S	35	1,550	3,000
Unocal	Guadalupe	Calif.	San Luis	1955	2,970	108	0	Sisquoc	S	35	1,550	3,000
Unocal	Tensleep	Wyo.	Natrona	5/81	18	6	2	Tensleep	S	18	500	2,500
Victory	Midway-Sunset	Calif.	Kern	1968	200	117	0	Potter	S	25.5	500-1,500	600 1,000
Whitter, Mitt	Midway-Sunset	Calif.	Kern	1965	200	350 +	0	Potter	S	35	2,500	1,000-1,500
HOT WATER												
Arco	Midway-Sunset	Calif.	Kern	8/85	5.5	15	4	Tulare	S	33	2,500	1,000
Texaco	McKittrick	Calif.	Kern	1981	12	18	9	Potter	S	35	4,000	1,100
Amoco	Winkleman Dome	Wyo.	Fremont	1964	160	21	15	Nugget	S	22.8	481	1,225

°API	Reservoir oil cp	Reservoir oil @°F.	Previous prod.	Residual oil saturation, % Start	Residual oil saturation, % End	Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
12	—	—	Prim.	—	—	HF	2,742	2,742	Succ.	Yes
12	—	—	Prim.	—	—	HF	2,530	2,530	Succ.	Yes
12	—	—	Prim.	—	—	HF	7,941	7,941	Succ.	Yes
11	—	60	Prim.	—	—	Term.	65	65	Disc.	No
—	—	—	Prim.	—	—	JS	2,216	2,216	Succ.	Yes
11	—	—	Prim.	—	—	JS	1,343	1,343	Succ.	Yes
11	—	—	Prim.	—	—	JS	658	658	Succ.	Yes
—	—	—	Prim.	—	—	JS	41	41	Succ.	Yes
—	—	—	Prim.	—	—	JS	770	770	Succ.	Yes
13	8,000	90	Steam Soak	29	2	NC	1,150	950	Succ.	Yes
13	8,000	90	Steam Soak	55	20	NC	1,050	850	Succ.	Yes
13	4,000	100	Prim.	65	55	HF	170	134	Prom.	Yes
11.5	800	130	Prim.	75	57	NC	1,000	1,000	Succ.	Yes
13	30	200	Steam Soak	45	20	HF	1,600	850	Succ.	Yes
13	7,000	84	Prim.	70	15	HF	635	610	Succ.	Yes
10	14,000	130	Prim.	—	—	NC	103	103	Succ.	Yes
8	100,000	100	None	—	—	NC	545	545	Succ.	Yes
7	50-100,000	110	None	—	—	HF	2,679	2,679	Succ.	Yes
8	100,000	110	None	—	—	NC	689	689	Succ.	Yes
10.4	13-25,000	110	Cyclic Steam Stimulation	—	—	HF	378	378	Prom.	Yes
13	20	220	Steam Stimulation	70	30	NC	791	762	Succ.	Yes
14	2,340	100	Steam Stimulation	58	25	JS	125	0	TETT	TETT
13	35	220	Steam Stimulation	60	30	JS	50	20	TETT	TETT
12	6,500	90	Steam Soak	55	20	NC	1,100	650	Succ.	Yes
12	1,500	90	Steam Soak	55	—	JS	400	150	Prom.	Yes
13	4,500	100	Cyclic	58	24	NC	13,817	13,817	Succ.	Yes
11	1,600	135	Cyclic	52	31	JS	800	790	TETT	No
13	1,500	90	Steam Stimulation	60	20	JS	410	60	Prom.	Yes
12	1,500	90	Steam Stimulation	60	20	NC	1,900	870	Succ.	Yes
13	10	250	Steam Stimulatoin	63	30	NC	1,655	1,530	Succ.	Yes
13	1,500	90	Steam Stimulation	60	20	HF	2,050	900	Succ.	Yes
13	5,000	78	Prim.	63	15	HF	592	592	Succ.	Yes
12	11,000	86	Prim.	60	30	JS	—	—	TETT	TETT
13	4,000	90	Prim.	60	20	JS	210	190	Succ.	Yes
12	11,000	86	Cyclic Steam	—	—	JS	450	450	Succ.	Yes
11.5	3,000	110	Steam Soak	65	15	NC	1,200	1,000	Succ.	Yes
11.5	1,000	130	Steam Soak	62	15	JS	600	300	TETT	TETT
11.5	1,000	130	Steam Soak	65	15	JS	1,200	900	Prom.	Yes
13	1,800	122	Steam Stimulation	50	20	JS	1,250	1,250	Prom.	Yes
25	7.6	68	WF	55	55	Term. 4/83	58	0	Disc.	No
47	1.6	139	Prim.	30	14	Term. 1/85	25	25	Disc.	No
16.2	107	100	Prim.	50	20	JS	151	117	Succ.	Yes
16.2	100	95	Prim.	50	20	JS	145	90	Prom.	Yes
11-24	—	—	Prim.	53	17	NC	30	21	Succ.	Yes
13	1,680	90	Prim.	55	22	HF	59	46	Succ.	Yes
14.7	665	90	Prim.	53	17	HF	368	363	Succ.	Yes
12	1,500	90	Steam Stimulation	60	20	JS	650	200	Prom.	Yes
13	1,800	122	Steam Stimulation	50	20	JS	1,250	1,250	Prom.	Yes
13	4,060	90	Prim.	70	30	HF	98,460	98,460	Succ.	Yes
19	24	12	WF	—	—	Term. 85	1,616	—	Disc.	No
16	200	95	Prim.	50	49	Term.	100	30	Disc.	No
13	—	—	Prim.	65	45	HF	4,500	3,800	Succ.	Yes
13.2	450	130	Prim.	66	52	JS	131	58	TETT	TETT
13.6	450	130	Prim.	63	49	HF	122	122	Succ.	Yes
13.6	450	130	Prim.	59	40	HF	111	111	Succ.	Yes
13.7	450	130	Prim.	62	41	HF	53	53	Succ.	Yes
11.3	500	170	Steam Soak	60	36	NC	1,214	1,214	Succ.	Yes
11.3	300	180	Steam Soak	60	30	NC	366	366	Succ.	Yes
13	700	150	Steam Soak	55	35	NC	275	275	Succ.	Yes
11.4	1,000	140	Steam Soak	60	27	HF	790	790	Succ.	Yes
11.3	100	220	Steam Soak	55	34	NC	2,000	2,000	Succ.	Yes
11.3	500	170	Prim.	57	35	HF	5,400	5,400	Succ.	Yes
11.4	10,000	100	Prim.	54	37.8	JS	950	740	Succ.	Yes
11.4	10,000	110	Steam Drive	52	28	JS	1,000	250	Prom	Yes
11.4	10,000	110	Steam Soak	57.2	32.3	HF	2,900	2,500	Succ.	Yes
11.4	10,000	110	Prim.	63.4	57.2	Term	1,300	1,100	Succ.	Yes
14	800	106	Prim.	50	35	JS	6.0	0	Prom.	Tett
13	900	114	Prim.	50	0	Term.	203	180	Disc.	No
12	75	110	Prim.	40	31	HF	300	180	Prom.	Yes
10.5	1,450	130	Prim.	65	49	HF	410	265	Succ.	Yes
9	20,000	110	Prim.	60	45	JS	60	100	Succ.	Yes
9	580	85	Cyclic	65	61	NC	2,000	300	Disc.	No
9	580	85	Prim.	80	60	HF	1,300	700	Succ.	Yes
14	580	90	Prim.	67	30	HF	200	110	Prom.	No
12	300	100	Prim.	65	—	HF	3,000	3,000	Succ.	Yes
13	2,200	100	Prim.	60	30	HF	6,500	6,500	Succ.	Yes
11	24,000	100	Steam flood	—	—	JS	125	25	TETT	TETT
13	40	210	Steam flood	50	30	HF	100	30	Disc.	No
14	1,000	81	Prim.	71	—	NC	650	650	Succ.	—

Another jump in chemical EOR projects

Operator	Field	State	County	Start date	Area, acres	Number wells Prod.	Inj.	Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
POLYMER												
American Petrofina	Garza	Tex.	Garza	10/82	120	8	4	San Andres	LS	19.8	4.1	2,900
American Petrofina	Westbrook	Tex.	Mitchell	12/80	4,740	145	39	Clearfork	LS	7.4	6.3	3,000
ARCO	So. Eunice/Langlie Mattix	N.M.	Lea	8/82	2,240	35	28	Seven Rivers Queen	S	11	1.3	3,700
ARCO	Healdton Area III	Okla.	Carter	10/83	1,500	198	40	Penn	S	23	115	1,000
ARCO	Horseshoe Gallup	N.M.	San Juan	11/83	450	10	8	Gallup	S	15	14	1,200
ARCO	East Texas (Kinney Strickland Leases)	Tex.	Gregg & Rusk	3/85	380	59	14	?	S	25	2,000	3,650
ARCO	Walnut Bend Unit I	Tex.	Cooke	11/83	2,891	23	16	Winger	S	17	103	5,500
ARCO	West Rozet	Wyo.	Campbell	9/84	120	4	1	Minnelusa	S	17	170	8,700
ARCO	West Nelson Rozet	Wyo.	Campbell	3/84	229	2	2	Minnelusa	S	17	170	8,700
ARCO	Camrick District	Okla.	Beaver	9/84	2,980	12	10	Upper Morrow	S	15	14	7,100
ARCO	Roehrs	Wyo.	Campbell	9/84	324	1	1	Minnelusa	S	17	92	7,465
Belnorth	Ruben	Wyo.	Sublette	12/70	800	12	6	Almy	S	14.1	1-56	3,300
Belnorth	McDonald Draw #4TB	Wyo.	Sublette	7/72	420	13	10	Almy	S	18	1-200	3,200
Belnorth	McDonald Draw #1TB	Wyo.	Sublette	1/72	435	1	1	Almy	S	16.7	2-59	3,050
Belnorth	Isenhour	Wyo.	Sublette	7/80	173	4	2	Almy	S	15-20	1-25	3,600
Belnorth	Long Island-Star Corral	Wyo.	Sublette	8/69	173	5	2	Almy	S	15.5	1-50	3,550
Belnorth	Saddle Ridge Unit	Wyo.	Sublette	12/74	376	9	8	Mesaverde	S	22	10-95	1,800
Belnorth	Tip Top Shallow Unit	Wyo.	Sublette	12/74	765	16	0	Almy/Mesaverde	S	12-20	1-200	1,150
Cenex	Sage Spring Creek-Unit A	Wyo.	Natrona	8/22/78	1,456	9	5	Dakota	S	13	50	7,400
Chevron	W. Bay	La.	Plaquemines	10/81	64	3	2	3A Sand	S	30	40	7,100
Chevron	W. Bay	La.	Plaquemines	10/81	42	4	1	3A Sand	S	34	4,600	7,100
Chevron	S. Stanley	Okla.	Osage	6/83	1,280	11	—	Burbank	S	18	300	2,900
Chevron	N. Stanley	Okla.	Osage	3/81	810	4	—	Burbank	S	18	300	2,900
Chevron	C-Bar	Tex.	Crane	6/83	2,600	56	32	San Andres	Dolo.	10	6	3,500
Chevron	N. Ward Estes	Tex.	Ward	12/81	11,900	473	442	Yates	S	18	10	2,600
Chevron	McElroy	Tex.	Crane	10/82	1,230	86	38	Grayburg	Dolo.	15	37	2,800
Chevron	Dune	Tex.	Crane	3/82	410	26	14	San Andres	Dolo.	14	28	3,350
Chevron	Goldsmith 5600	Tex.	Ector	9/83	2,560	82	32	Clearfork	Dolo.	15	28	5,600
Cities Service	Hoof	Kan.	Graham	6/82	960	18	8	Lansing-Kansas City	LS	12	74-113	3,700
Cities Service	Beverly Hills/West Pico	Calif.	Los Angeles	12/84	221	44	11	Repetto/Main	S	26.6-28	77-193	6,800
Cities Service	Harmony Hill	Kan.	Rooks	10/84	130	5	3	Lansing-Kansas City	LS	12.5	—	3,130
CNG	S.W. Davis Unit	Okla.	Murray	8/83	540	17	4	Oil Creek	S	12.8	1-1,150	4,980
Conoco	Frannie	Wyo.	Park	9/85	2,020	75	39	Phosphoria-Tensleep	S	13.6	130	3,300
Conoco	South Elk Basin	Wyo.	Park	11/84	540	9	6	Embar-Tensleep	S	15.1	90	7,100
Conoco	Big Muddy	Wyo.	Converse	3/81	90	16	9	Wall Creek	S	19.5	52	3,180
Conoco	Vacuum-State #35 Lease	N.M.	Lea	3/83	240	8	9	Grayburg/San Andres	S/LS	10.9	13.7	4,500
Cox & Cox	Carthage	Okla.	Tex.	1/82	1,640	18	10	Morrow	S	19	200	4,500
Exxon	W. Yellow Creek	Miss.	Wayne	9/76	4,813	51	24	Eutaw	S	24	112	4,950
Exxon	Hewitt	Okla.	Carter	3/81	886	85	52	Hewitt	S	21	175	2,400
Gallagher Drilling	Stewart East	Wyo.	Campbell	7/82	200	4	1	Minnelusa	S	15.6	250	8,000
Grace	High Five	Mont.	Roseland	7/81	800	9	2	Stensvad	S	18	200	5,600
Gulf	W. Bay	La.	Plaquemines	10/81	64	3	1	3A Sand	S	30	40	7,100
Exxon	Roland	Ill.	White	1985	—	16	14	Chester	S	15.7	16-626	3,100
Exxon	Roland	Ill.	White/Gallatin	1985	—	12	8	Chester	S	19.5	113-279	3,000
Exxon	Camrick	Okla.	Beaver/Texas	1984	—	43	27	Upper Morrow	S	15	1-250	7,530
Exxon	Loudon	Ill.	—	1985	—	760	554	Chester	S	19	30-500	1,800
Exxon	Conroe	Tex.	Montgomery	1985	—	—	—	2B	S	—	50-5,500	4,900
Exxon	Webster	Tex.	Harris	1985	—	7	3	Frio 1A	S	28	206	5,900
Exxon	Trapp	Kan.	Russell	1984	—	15	9	Lansing-Kansas City	LS	18.4	0.1-300	3,215
Exxon	Omaha	Ill.	Gallatin	1984	—	15	4	Chester	S	18	20-387	1,950
Gulf	W. Bay	La.	Plaquemines	10/81	42	4	1	3A Sand	S	34	4,600	7,100
Gulf	S. Stanley	Okla.	Osage	6/83	1,280	11	—	Burbank	S	18	300	2,850-2,900
Gulf	N. Stanley	Okla.	Osage	3/81	810	4	—	Burbank	S	18	300	2,850-2,900
Gulf	C-Bar	Tex.	Crane	6/83	2,600	56	32	San Andres	Dolo.	10	6	3,500
Gulf	N. Ward Estes	Tex.	Ward	12/81	11,900	473	442	Yates	S	18	10	2,600
Gulf	McElroy	Tex.	Crane	10/82	1,230	74	28	Grayburg	Dolo.	15	37	2,800
Gulf	Dune	Tex.	Crane	3/82	410	26	14	San Andres	Dolo.	14	28	3,350
Gulf	Goldsmith 5600	Tex.	Ector	9/83	2,560	82	32	Clearfork	Dolo.	15	28	5,600
Hunt	East Texas	Tex.	Rusk	8/1/82	508	87	14	Woodbine	S	25	300	3,500
Inexco	S. Heart Heath Sand Unit	N.D.	Stark	7/83	700	2	—	Tyler Heath	S	14.8	75	8,000
Kerr-McGee	Foster	Tex.	Ector	8/30/83	69	9	3	San Andres	Dolo.	15	7	4,475
Lawrence-Allison	NPR-3, Teapot Dome	Wyo.	Natrona	10/31/82	2.5	6	2	Shannon	S	18	63	550
Marathon	Yates	Tex.	Pecos	12/20/83	6,900	268	210	Queen Grayburg-San Andres	Dolo	15	62	1,500
Marathon	Main Consolidated	Ill.	Crawford	7/81	130	25	14	Robinson	S	18	115	1,100
Marathon	Kinney Coastal	Wyo.	Wyoming Park & Big Horn Counties	11/27/84	1,500	32	22	Tensleep	S	11.2	50	4,240
Mobil	Postle, West Hough, Morrow Unit	Okla.	Texas	4/83	7,601	39	24	Morrow	S	15.7	45	6,500
Mobil	Postle, Hovey Morrow Unit	Okla.	Texas	9/82	7,881	34	17	Morrow	S	16.8	45	6,200
Mobil	Postle, Hough Morrow "A" Unit	Okla.	Texas	7/82	3,360	24	15	Morrow	S	15.8	45	6,200
Mobil	Postle, Postle Upper Morrow Unit	Okla.	Texas	11/82	3,994	29	19	Morrow	S	15.4	45	6,100
Mobil	Sho-Vel-Tum	Okla.	Stevens	8/82	350	20	11	Deese	S	16	4.5-123	4,000
Mobil	Cement	Okla.	Caddo	11/81	1,390	112	29	Fortuna Noble-Olson	S	19.2	23	2,100
Mobil	Cushing	Okla.	Creek	5/31/84	120	4	2	Bartlesville	S	19	290	2,700
Mobil	Golden Trend	Okla.	Garvin/Grady	10/85	800	14	4	Springer	S	12.5	58	9,400
Mobil	Cement	Okla.	Caddo	11/81	1,510	96	23	Fortuna Noble-Olson	S	19.2	18	2,000-3,200
Mobil	Fitts	Okla.	Pontotoc	7/82	1,520	148	87	Cromwell 60	S/LS	10-25	6-60	2,500-4,000
Mobil	Sho-Vel-Tum	Okla.	Carter	7/82	1,700	109	53	Deese	S	17.2	100	3,350
Mobil	Healdton	Okla.	Jefferson/Carter	7/81	1,045	151	41	Healdton	S	24.2	386	1,000
Mobil	Loudon	Ill.	Fayette	11/82	240	24	23	Bendist Paint Creek	S	18.5	10-360	1,500

Table G

Reservoir oil				Residual oil saturation, %						
°API	cp	@°F.	Previous prod.	Start	End	Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
36	2.5	90	WF	40	—	NC	—	—	NE	Yes
26	9.1	90	WF	50	—	HF	2,000	—	NE	Yes
35	2.6	90	WF	63	60	HF	500	25	Prom.	Yes
31	13	87	WF	37	35.5	JS	920	90	Succ.	Yes
42	1.7	87	WF	—	—	NC	500	—	Disc.	No
39	1.0	140	WF	—	—	JS	1,197	350	Succ.	Yes
32	2.8	143	WF	39	26	JS	550	25	Prom.	Yes
22	24	170	WF	—	—	JS	754	—	TETT	TETT
21	12	197	WF	—	—	JS	176	—	Prom.	Yes
39	1.5	149	WF	—	—	JS	290	—	TETT	TETT
25	9	177	WF	—	—	JS	14	5	Succ.	Yes
43	0.95	95	Prim.	42.0	45.4	NC	640	32	Succ.	Yes
41.8	1.45	95	WF	43.8	29.1	NC	215	11	Succ.	Yes
42	1.4	90	WF	40.3	36.7	NC	27	1	Succ.	Yes
41.5	1.2	100	Prim.	38.1	27.0	HF	190	12	Succ.	Yes
44	1.2	100	Prim.	43.6	23.9	NC	85	3	Succ.	Yes
44	2.33	85	WF	27.5	27.3	NC	200	12	Succ.	Yes
44	1.3	80	Prim.	41.3	36.9	Term 83	180	1	Disc.	No
36	1.4	160	WF	45	21	NC	500	200	Succ.	Yes
41	2.3	120	WF	36	32	HF	90	—	TETT	TETT
30	2.4	165	Prim.	65	—	HF	0	0	—	No
32	2.5	165	Prim.	54	—	HF	28	28	—	—
36	5	107	WF	51	—	HF	111	15	TETT	—
36	5	107	WF	39	—	NC	185	75	Succ.	Yes
33	1.5	95	WF	76	—	JS	400	0	TETT	—
33	1.4	83	WF	74	—	JS	6,571	232	Prom.	Yes
32	3.5	95	WF	76	—	JS	1,746	447	Prom.	Yes
32	3.5	100	WF	87	—	JS	290	84	Prom.	Yes
40	1	105	WF	73	—	JS	1,120	200	TETT	Yes
26-32	1	200	WF	37.5	—	JS	2,250	75	Prom.	TETT
38.6	3.7	105	Prim.	49	34	JS	85	40	Prom.	Yes
39	1.1	108	WF	6.2	—	JS	2,100	—	TETT	TETT
26.3	15	95	Prim/WF	—	—	JS	—	—	Prom.	TETT
29	6.0	140	Prim/WF	—	—	HF	—	—	Prom.	TETT
34	5.6	118	Prim/WF	—	—	Term (10/85)	—	—	Disc.	No
37	1.3	101	Prim/WF	—	—	HF	—	—	Succ.	Yes
39	2.8	120	WF	51	—	HF	800	250	Prom.	Yes
20	20	150′	WF	84	75	NC	—	—	Succ.	Yes
35	8.7	96	WF	43	—	HF	—	—	Prom.	Yes
20	20	124	Prim.	94	60	JS	300	250	Succ.	Yes
40	—	140	Prim.	—	—	JS	480	—	TETT	Yes
30.3	2.44	165	Prim.	65	—	HF	—	—		
36	10	87	WF	—	—	JS	—	—	TETT	TETT
32	10	83	WF	—	—	JS	—	—	TETT	TETT
39	1.5	142	WF	—	—	JS	—	—	TETT	TETT
36	6	75	WF	—	—	JS	—	—	TETT	TETT
—	—	—	Prom.	—	—	JS	—	—	TETT	TETT
29	1.3	165	WF	—	—	JS	—	—	TETT	TETT
38	1.4	97	WF	—	—	JS	—	—	TETT	TETT
28	17	78	WF	—	—	JS	—	—	TETT	TETT
31.8	2.48	165	Prim.	54	—	HF	—	—		
36.6	4.8	107	WF	51.5	—	HF	—	—		
36.6	4.8	107	WF	51.5	—	HF	—	—		
33	1.5	95	WF	76	—	NC	—	—		
33	14	83	WF	74	—	JS	—	—		
32	3.5	95	WF	76	—	JS	—	—		
32	3.5	100	WF	87.5	—	JS	—	—		
40	0.85	105	WF	73	—	JS	—	—		
37	1.9	142	Prim.	57	33	HF	950	750	Succ.	Yes
42	2.82	190	WF	20.2	41.4	Term 8/85	230	—	Disc.	No
34	3	100	WF	53	—	Term	—	—		
33	10	65	Prim.	40	29	HF	16	0	NE	—
30	5.5	82	Prim.	—	—	JS	27,283	—	Succ.	Yes
30	18.0	70	Prim.	51	—	NC	30	30	Disc.	No
22.1	20	140	Prim/WF	—	—	JS	1,500	—	TETT	TETT
40	1.03	145	WF	43	41	NC	1,050	0	Disc.	Yes
41	1.03	146	WF	45	44	NC	1,150	0	Disc.	Yes
41	1.03	147	WF	39	37	NC	800	0	Disc.	Yes
40	1.03	147	WF	40	38	NC	700	0	Disc.	Yes
31	5.6	105	WF	36	—	HF	91	5	Succ.	Yes
34	6.2	112	WF	51.9	—	Term	237	0	Disc.	No
39	4	94	WF	31	—	JS	137	60	Prom.	No
38	3	160	WF	49	—	JS	200	—	TETT	TETT
35	5	112	WF	3.4	—	HF	480	163	Succ.	Yes
40	4	115	WF	57	—	HF	8,585	980	Succ.	Yes
30-38	3-5-10	102	WF	52.4	—	HF	1,477	74	Succ.	Yes
32	10	84.2	WF	46.2	—	HF	785	118	Succ.	Yes
37	4	100	WF	49	47	HF	123	15	Prom.	Yes

Another jump in chemical EOR projects ... continued

Operator	Field	State	County	Start date	Area, acres	Number wells		Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
						Prod.	Inj.					
Mobil	Sho-Vel-Tum	Okla.	Stephens	5/81	160	32	12	Permian	S	20	130	750
Mobil	Sho-Vel-Tum	Okla.	Carter	8/82	451	30	6	Deese	S	20	192	3,900
Mobil	Sho-Vel-Tum	Okla.	Stephens	11/82	1,980	100	43	Deese	S	17.4	44.8	4,900
Marathon Oil	Grass Creek	Wyo.	Hot Springs	10/28/85	740	40	18	Phosphoria-Tensleep	S/LS	33	132	4,000
Marathon Oil	Oregon Basin-North Embar Tensleep	Wyo.	Park	11/26/83	3,000	152	79	Embar-Tensleep	S/LS	35	261	3,445
Marathon Oil	Byron	Wyo.	Big Horn	12/27/82	1,500	50	38	Embar-Tensleep	S/LS	13.9	4.5-78	5,600
Marathon Oil	Oregon Basin-SETPA	Wyo.	Park	1/15/85	375	4	2	Minnelusa	S	16.5	100	6,300
Mericle	Chico Martinez	Calif.	Kern	1981	300	—	—	Tulare	S	41.9	—	2,000
Meridian Oil	Deadman Creek Unit	Wyo.	Crook	6/80	375	4	2	Minnelusa	S	16.5	100	6,300
Mitchell Energy	Jacksboro, S.	Tex.	Jacksboro	5/8/82	270	10	7	Strawn	S	19.9	86	1,975
Mitchell Energy	Lucy, N.	Tex.	Borden	10/83	550	8	4	Pennsylvanian	LS	9.7	30	7,640
Mitchell Energy	Alba Northeast Unit	Tex.	Wood	7/11/80	410	21	7	Sub-Clarksville	S	21.4	471	4,100
Mitchell Energy	Alba Southeast	Tex.	Wood	2/1/72	731	18	9	Sub-Clarksville	S	23.3	524.5	4,200
Mobil	Sho-Vel-Tum	Okla.	Carter	10/82	450	21	14	Deese	S	17	45-860	3,500
Mobil	Sho-Vel-Tum	Okla.	Carter	7/82	2,750	136	56	Tatums Stray Pennington	S	22.3	787	2,750
Mobil	Cement	Okla.	Caddo	9/81	1,120	71	23	Fortuna/ Noble Olson	S	36.1	74	2,400-3,325
Mobil	Sho-Vel-Tum	Okla.	Stephens	8/82	1,360	71	52	Deese Springer	S	18.1	66	4,400
National Cooperative Refinery Assoc. (NCRA)	Stewart Ranch	Wyo.	Campbell	2/72	1,200	15	15	Minnelusa	S	16.5	92	8,100
Osborn Heirs	Tholson	Wyo.	Campbell	12/82	9,000	7	1	Minnelusa	S	21	460	9,000
Petromac Inc.	Slocum	Tex.	Elkhart	4/85	118	2	2	Woodbine	S	24	200	5,800
Phillips	Vacuum	N.M.	Lea	8/83	320	11	8	San Andres	Dolo.	12	20	4,500
Phillips	Lick Creek	Ark.	Bradley-Union	9/84	1,640	39	23	Meakin	S	30.3	1,200	2,500
Phillips	Bates	Kan.	Sumner	1/84	640	14	2	Mississippi	LS	15.5	19.7	3,700
Phillips	North Burbank	Okla.	Osage	3/83	1,440	58	23	Burbank	S	15.5	50	2,900
Phillips	North Burbank	Okla.	Osage	9/80	1,440	84	36	Burbank	S	15.5	50	2,900
Phillips	South Burbank	Okla.	Osage	7/82	720	34	23	Burbank	S	19.5	150	2,750
Phillips	Golden Trend	Okla.	Grady	10/83	720	4	4	Springer	S	9.7	58	9,800
Phillips	South Cowden	Tex.	Ector	9/83	2,050	57	24	Grayburg	Dolo.	11.9	3.7	4,750
Samedan	S. Robertson	Tex.	Gaines	1/81	1,600	56	11	Glorieta/Clfk.	Dolo.	7.9	.5	5,800
Samedan	Kuehne Ranch Unit	Wyo.	Campbell	3/81	645	5	2	Minnelusa	S	14.4	52.8	7,900
Shell	Sholem-Alechem	Okla.	Stephens	8/20/84	430	11	—	Deesa Sand	S	20	50	3,200
Shell	Big Mineral Creek-Barnes Sand Unit	Tex.	Grayson	12/1/84	1,065	20	—	Barnes Sand	S	18.5	55	5,000
Shell	Big Mineral Creek-S Sand [illegible]	Tex.	Grayson	5/15/85	1,600	12	—	S Sand	S	13	28	5,200
Sun	Red Ri[illegible]ll Bayou	La.	DeSoto Parish	2/81	—	24	31	Paluxy	S	31.0	10-10,000	2,400
Southland Royalty	Foster	Tex.	Ector	5/83	240	24	12	San Andres	Dolo.	12	5.8	4,200
Mobil	Sho-Vel-Tum	Okla.	Stephens	11/82	1,980	100	43	Deese	S	17.4	44.8	4,900
Mobil	Sho-Vel-Tum	Okla.	Stephens/Carter	12/82	1,285	32	8	Springer	S	15.4	17.9	5,200
Mobil	Sho-Vel-Tum	Okla.	Carter	7/82	780	35	29	Deese	S	18.8	95.3	3,500
Sun	Stephens County Regular	Tex.	Stephens	2/80	700	12	12	Caddo	LS	14.2	11	—
Sun	Stephens County Regular	Tex.	Stephens	—	3,900	75	64	Caddo	LS	—	—	—
Sun	Fitts	Okla.	Pontotoc	1982	3,030	125	111	Viola	LS	13.6	1-36	—
Sun	Hitts Lake	Tex.	Smith	10/80	—	29	5	Paluxy	S	18.9	300	7,250
Terra	Kummerfeld Minnelusa Sand Unit	Wyo.	Crook	5/75	712	4	5	Minnelusa	S	16.5	15-95	7,600
Tesoro	Elaine (San Miguel)	Tex.	Dimmit	12/8/81	1,260	21	17	San Miguel	S	21.7	6	4,450
Tesoro	Hospah Sand Unit	N.M.	McKinley	1/16/83	1,061	44	17	Upper Hospah	S	24.7	467	1,600
Tesoro	S. Hospah Lower Sand Oil Pool	N.M.	McKinley	10/1/83	594.6	50	10	Lower Hospah	S	27.3	1,282	1,600
Texaco	Ventura	Calif.	Ventura	3/83	800	95	56	C-Block	S	20.0	130	5,500
Texaco	Richfield	Calif.	Orange	12/78	200	44	26	Chapman	S	29	760	2,917
Texaco	Richfield	Calif.	Orange	5/83	52	42	16	Kraemer	S	24	300-500	4,100
Texaco	Black Diamond	Tex.	Jim Hogg	4/27/83	200	5	3	Pettus II	S	25	212	4,550
Texaco	Jordan	Tex.	Ector & Crane	11/84	1,513	82	30	San Andres	Dolo	10.5	6	3,600
Texaco	Penwell	Tex.	Ector	11/84	4,470	137	36	San Andres	Dolo	7.8	2.2	3,600
Texaco	Cogdell	Tex.	Kent & Scurry	6/83	15,378	107	126	Canyon Reef Limestone	LS	9.6	5.0	6,800
Texaco	Spraberry, Deep	Tex.	Dawson	7/83	2,368	15	11	Spraberry Lwr. Sand	S	16.3	5.7	7,100
Texaco	Spraberry, Deep	Tex.	Dawson	7/83	2,368	15	11	Spraberry Lwr. Sand	S	16.3	5.7	7,100
Texaco	Spraberry, Deep	Tex.	Dawson	7/83	2,448	18	20	Upper Spraberry Sand	S	17.9	10.6	6,500
Texaco	Mabee	Tex.	Andrews/Martin	12/81	13,500	286	277	San Andres	Dolo	10.5	1.5	4,700
Texaco	Cowden, North	Tex.	Ector/Andrews	12/84	2,440	60	61	Grayburg/San Andres	S/LS/ Dolo	10.1	3.8	4,450
Texaco	McElroy	Tex.	Crane/Upton	10/81	7,550	518	333	Grayburg/San Andres	Dolo	11	5	3,000
Texaco	Flowers	Tex.	Stonewall	8/83	5,876	155	67	Canyon	S	14.7	2	4,200
Texaco	Langlie Mattix	N.M.	Lea	2/83	9,360	124	110	Queen & Seven Rivers	S	11.4	7.2	3,650
Texaco	Levelland	Tex.	Hockley	4/83	3,595	108	37	San Andres	Dolo	9.98	0.6	4,720
Texaco	Vacuum Grayburg-San Andres	N.M.	Lea	12/81	1,486	37	29	Grayburg/San Andres	Dolo	11.0	18	4,720
Texaco	Vacuum Grayburg/San Andres	N.M.	Lea	4/83	3,046	77	81	Grayburg/San Andres	Dolo	11.55	13	4,720
Texaco	Slaughter	Tex.	Cochran	2/27/84	1,887	33	15	San Andres	Dolo	11.2	6.02	5,000
Texaco	Slaughter	Tex.	Cochran	12/81	7,406	278	91	San Andres	Dolo	10.7	3.0	5,000
Texaco	Robertson North	Tex.	Gaines	9/83	1,400	30	16	Glorieta	Dolo	7.7	1.54	5,809
Texaco	Harris	Tex.	Gaines	10/83	3,800	80	80	Glorieta	Dolo	8.6	3.0	5,818
Texaco	Cushing	Okla.	Creek	12/83	480	14	—	Bartlesville	S	17	100	2,670
Texaco	Sho-Vel-Tum	Okla.	Stephens	4/85	3,740	87	54	Sims	S	19.1	190	4,000-7,000
Texaco	Hoxbar	Okla.	Carter	4/12/84	220	8	5	Hoxbar	S	21	84	2,400
Texaco	Sho-Vel-Tum	Okla.	Carter	2/83	225	15	8	Deese	S	17	59	4,400

°API	Reservoir oil		Previous prod.	Residual oil saturation, %		Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
	cp	@°F.		Start	End					
29	50	69	WF	49	—	HF	188	85	Succ.	Yes
34	10.5	89	WF	53	—	HF	600	85	Succ.	Yes
26	13.6	120	WF	47	—	HF	764	156	Succ.	Yes
24	15	119	Prim/WF	—	—	JS	2,700	—	TETT	TETT
22.5	8.2	108	Prim/WF	—	—	HF	15,200	2,230	Succ.	Yes
23	17	121	Prim/WF	—	—	HF	5,400	795	Succ.	Yes
21	34	120	Prim/WF	66.5	47.5	HF	350	50	Succ.	Yes
12	—	70	Prim.	—	—	JS	—	—	—	
21	34	120	Prim/WF	66.5	47.5	HF	350	50	Succ.	Yes
40	1.73	100	Prim.	50	28	NC	356	356	Succ.	Yes
40	0.44	140	Prim.	52.6	35.7	JS	280	175	TETT	TETT
15.1	75	150	WF	62.6	58.7	HF	104	104	Disc.	—
15.5	75	150	Prim.	69.5	60.7	HF	196	196	Succ.	Yes
28	20	80	WF	49	—	HF	170	33	Succ.	No
25	68	83	WF	48	—	HF	1,866	393	Succ.	Yes
35	6	90-95	WF	57	—	HF	683	115	Succ.	Yes
30	16	117	WF	55	—	HF	1,108	179	Succ.	Yes
20	25	136	WF	68	49	NC	1,167	1,167	Succ.	Yes
22	8	185	WF	49.2	46.7	Term 4/85	300	0	NE	Yes
44	0.7	175	WF	50	30	JS	70	70	Prom.	Yes
37	1.2	101	Prim.	74.9	58.2	HF	3,200	—	Prom.	Yes
17	160	118	Immiscible (02 WF)	55	46	HF	450	100	Succ.	Yes
42	0.6	117	WF	50	48	HF	200	—	TETT	TETT
39	3	120	WF	48	44	HF	350	75	Prom.	Yes
39	3	120	WF	53	47	HF	1,000	600	Succ.	Yes
39	3	120	WF	41	37	NC	250	25	Disc.	No
38	2.9	155	WF	54	53	HF	50	—	TETT	TETT
35	3.4	96	WF	67	59	HF	1,500	30	TETT	TETT
34	1	107	WF	64	NA	HF	2,041	—	Succ.	Yes
26	8	134	Prim/WF	—	—	HF	280	26	Succ.	Yes
28	10	100	WF	54	49	—	276	50	Succ.	Yes
37	1.5	120	WF	50	47	JS	580	—	TETT	No
37.9	1.67	124	WF	44	37	JS	811	—	TETT	TETT
41	2.07	120	WF	—	—	Term 5/1/85	—	—	Disc	No
34	1.2	101	WF	—	—	Term				
26	13.6	120	WF	47	—	HF	764	156	Succ.	Yes
39	2.4	110	WF	50	—	HF	70	0	Prom.	Yes
30	15.7	112	WF	47.9	—	HF	491	166	Succ.	Yes
39	1.8	131	—	—	—	HF	211	—	—	—
39	1.8	131	WF	—	—	HF	2,751	—	Succ.	Yes
39	3.2	119	WF	—	—	HF	2,825	—	Succ.	Yes
26	2.713	210	WF	—	—	HF	1,251	—	Succ.	Yes
23	38	130	Prim/WF	55.3	44.9	HF	510	190	Succ.	Yes
36	3	140	—	80.2	67.0	HF	284	199	Succ.	Yes
30	13	95	WF	69.0	68.2	JS	248	35	Succ.	Yes
24	35	95	WF	82.5	65.9	JS	584	30	Succ.	Yes
30.5	1.3	160	WF	—	—	JS	6,300	—	TETT	TETT
18	57	117	WF	—	—	Term 4/1/85	956	—	Disc.	No
23	12-45	138	WF	—	—	Term 4/1/85	1,182	—	Disc.	No
48	0.4	164	Prim	68	41	HF	485	427	Succ.	Yes
34	2.8	95	WF	54	53	JS	825	—	TETT	TETT
33	1.8	95	WF	54	53	JS	1,492	—	TETT	TETT
41.7	0.62	128	WF	28	26	HF	5,673	—	TETT	TETT
39.3	0.885	130	WF	42	34	HF	432	—	TETT	TETT
39.3	0.885	130	WF	42	34	HF	432	—	TETT	TETT
40.6	0.92	103	WF	37	34	HF	213	—	TETT	TETT
32.0	2.38	106	WF	43	38	HF	6,962	—	TETT	TETT
34	1.63	94	WF	47	45	JS	584	—	TETT	TETT
32	2.6	95	WF	59	33	HF	7,511	—	TETT	TETT
42	1.9	130	WF	40	35	HF	929	—	TETT	TETT
35	2.8	94	WF	50.7	46.2	HF	1,226	110	Prom.	Yes
30.5	1.47	107	WF	45	44	NC	2,356	0	TETT	TETT
38	1.47	105	WF	45	44	HF	3,941	0	TETT	TETT
38.0	1.47	105	WF	45	44	NC	9,222	0	TETT	TETT
31	1.47	110	WF	53	50	JS	428	0	TETT	TETT
31	1.47	107	WF	49.4	45.6	C	6,150	900	Succ.	Yes
30.8	0.67	—	WF	45	44	C	1,127	0	Prom	TETT
30.8	3.1	—	WF	45	44	C	7,820	0	Prom	TETT
41	2.5	100	WF	57	54	HF	171	21	Prom	Yes
24-29	5	105-135	WF	50	47.1	JS	4,900	0	Prom.	Yes
33	10	94	WF	39	37	HF	80	0	TETT	Yes
20-34	4.30	102	WF	38	37.2	NC	101	0	Disc	Yes

Another jump in chemical EOR projects ... continued

Operator	Field	State	County	Start date	Area, acres	Number wells Prod.	Inj.	Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
Texaco	Blue Buttes	N.D.	McKenzie	12/85	12,770	37	21	Madison	LS	9.6	22	9,400
Texaco	Balko South	Okla.	Beaver City	8/82	1,320	8	10	Kansas City	LS	21	0-1,070	6,100
Texaco	Atlantic	Okla.	Osage	5/31/85	1,920	43	13	Mississippi Chat & Burgess	S	25	25	2,500
Texaco	Apache Pool	Okla.	Caddo	9/83	1,060	19	7	Bromide	S	13.6	350	3,900
Texaco	Aneth Unit	Utah	San Juan	9/85	17,000	154	173	Paradox	LS	10.6	18.3	5,300
Toco Corp.	Clareton	Wyo.	Weston	10/85	200	6	1	Newcastle	S	15-18	1-15	6,000
Toco Corp.	Mush Creek	Wyo.	Weston	1969	900	8	6	Newcastle	S	15-18	1-15	4,400
Unocal	Dos Cuadras	Calif.	Santa Barbara	6/83	320	29/21	10/10	EP/FP	S	31/27	680/260	1,280/1,650
Unocal	Orcutt	Calif.	Santa Barbara	6/84	1,350	74	41	Pt. Sal	S	22.5	78	3,750
Unocal	Farnsworth	Tex.	Ochiltree	9/83	13,005	39	41	Morrow	S	14.5	21.8	7,400
Unocal	Osage-Hominy	Okla.	Osage	4/83	2,880	84	33	Miss. Chat	Chertacious Limestone	30	27	2,880
Unocal	Healdton	Okla.	Carter	12/82	2,010	83	80	Healdton Sands	S	26.2	346	800
Unocal	Southwest Van Unit	Tex.	Van Zandt	9/84	529	28	25	Lewisville	S	26	100	2,600
Unocal	Howard Glasscock	Tex.	Howard	1/17/83	169	12	2	Queen	S	22	37	1,600
Texaco	Sho-Vel-Tum	Okla.	Carter	1/83	1,390	85	39	Hoxbar Deese	S	20.3	200	3,100
Texaco	Tonti	Ill.	Marion	10/84	285	10	11	Renoist Auxvases McClusky	LS	47.3	358	1,900-2,200
Texaco	Sumatra	Mt.	Rosebud	12/84	4,778	27	20	Tyler	S	15.3	48	4,900
Texaco	Sho-Vel-Tum	Okla.	Stephens	6/84	150	15	13	Permian	S	25.3	128	1,100
Texaco	Salem	Ill.	Marion	7/82	8,800	330	244	Mississippian & Devonian	S	10.5-17.9	5-2,200	1,700-3,600
Texaco	Naval Reserve	Okla.	Osage	2/82	3,360	120	64	Bartlesville	S	15.8	12	2,650
Texaco	Loudon	Ill.	Fayette	12/28/84	800	18	12	Weiler	S	21	142	1,550
Texaco	Hewitt	Okla.	Carter	7/31/84	1,200	58	38	Lone Grove	S	18	50	4,500
Texaco	Sho-Vel-Tum	Okla.	Stephens	8/81	190	6	5	Deese	S	17.4	216	5,500
Texaco	Hewitt	Okla.	Carter	11/85	100	6	3	Lone Grove	S	18	50	4,000
Texaco	Hewitt	Okla.	Carter	8/82	300	15	9	Hoxbar	S	19	270	2,350
Texaco	Hewitt	Okla.	Carter	3/22/84	240	10	5	Hoxbar	S	21	100	2,600
Texaco	Glenn Pool	Okla.	Creek	1/84	480	18	8	Bartlesville	S	19.5	400	1,500
Texaco	Sho-Vel-Tum	Okla.	Carter	5/85	570	27	24	Deese	S	17	70	3,500
Texaco	Dale	Ill.	Hamilton	11/85	4,100	35	19	Aux Vases	S	14.5	68	2,500
Texaco	Carthage, N.E.	Okla.	Texas	4/83	1,024	7	6	Morrow "A"	S	18.6	92	4,400
Unocal	Smyer	Tex.	Hockley	11/8/84	4,410	72	38	Clearfork	Dolo	8.25	1-20	5,900
Unocal	North Riley	Tex.	Gaines	2/84	6,720	105	40	Clearfork	Dolo	7.7	12	6,300
Unocal	South Cowden	Tex.	Ector	1/86	1,600	38	—	Grayburg	Dolo	8.5	3.1	4,500
Unocal	Dollarhide (Clearfork)	Tex.	Andrews	10/85	2,800	57	33	Clearfork	Dolo	11.6	8.5	6,500
MICELLAR-POLYMER												
Amoco	Torchlight	Wyo.	Big Horn	1981	6.4	1	4	Tensleep	S	14.2	61	3,100
Chevron	Berry Hill (Kiefer)	Okla.	Creek	9/82	82	32	21	Glenn	22S	20	150	1,450
Cities Service	Madison	Kan.	Greenwood	8/82	40	25	16	Bartlesville	S	18.9	42	1,900
Cities Service	Eldorado	Kan.	Butler	6/74	51.2	8	19	Admire	S	24	208-265	650
Gary	Bell Creek "A"	Mont.	Powder River	2/81	179	16	9	Muddy	S	24.9	1,218	4,500
Gary	Bell Creek Unit "A"	Mont.	Powder River	10/77	160	9	4	Muddy	S	27.0	1,050	4,650
Gary	S. Johnson	Ill.	Clark	6/81	49	36	22	Partlow	S	18.3	302	475
Gulf	Kiefer	Okla.	Creek	9/82	82	32	21	Glenn	S	20	150	1,450
Marathon	Lawrence-Robins 202-B Project	Ill.	Lawrence	10/85	1.25	1	—	Bridgeport Main	S	20.6	352	900
Marathon	Lawrence Robins 102 B Maraflood	Ill.	Lawrence	8/82	25	12	5	Bridgeport	S	21	398	950
Marathon	Main Consolidated M-2 Project	Ill.	Crawford	7/80	331	72	53	Robinson	S	19	150	1,000
Marathon	Main Consolidated M-1 Project	Ill.	Crawford	2/77	407	132	114	Robinson	S	19	102	1,000
Marathon Oil	Main Consolidated 119-R Project	Ill.	Crawford	9/68	40	27	18	Robinson	S	20	200	1,000
Mobley, O.B.	Wesgum	Ark.	Ouachita	6/80	130	3	1	Smackover	LS	26.7	36	5,800
Mobley, O.B.	Lewisville	Ark.	Lafayette	7/80	458	8	3	Smackover	LS	21.8	24	6,800
Phillips	N. Burbank	Okla.	Osage	1975	90	16	9	Burbank	S	15.5	50	2,900
Pennzoil	Bradford	Pa.	McKean	7/82	220	57	—	Bradford 3rd	S	21	188	1,900
Texaco	Sho-Vel-Tum	Okla.	Stephens	8/83	8.75	4	3	Sims	WF	17	83	7,000
Texaco	Main Consolidated	Ill.	Crawford	12/81	10.88	9	4	Robinson	WF	21.8	100	1,040
Texaco	Salem Consolidated	Ill.	Marion	8/81	60	20	12	Benoist	S	15.4	154	1,750
Unocal Corp.	East Coalinga Extension	Calif.	Fresno	12/80	20	9	4	Gatchell	S	14.2	150	7,500
Woodstock Oil Corp.	Wizard Wells (4,900 ft Caddo)	Tex.		1981	700	11	—	Caddo	S	14	50	4,900
ALKALINE												
Chevron	Whittier	Calif.	Los Angeles	2/28/83	373	25	—	2nd & 3rd Zones	S	28	350	2,300
Chevron	Whittier	Calif.	L.A.	2/83	373	25	—	2nd & 3rd Zones	S	28	350	2,300
Chevron	Bison Basin	Wyo.	Fremont	7/80	190	16	6	Frontier	S	22	144	1,300
Chevron	Quarantine Bay	La.	Plaquemines	11/81	200	5	3	3 (RB)SU	S	27	50-2,000	8,200
Conoco	San Miguelito	Calif.	Ventura	11/82	316	17	14	Third Grubb	S	15.1	36	8,011
Gulf	N. Ward Estes	Tex.	Ward	7/77	40	8	1	Yates	S	21	39	2,700
Gulf	N. Ward Estes	Tex.	Ward	7/77	40	8	1	Yates	S	20	9	2,450
Gulf	Toborg	Tex.	Pecos	4/80	5	1	4	Toborg	Congl	20	216	350
Gulf	Bison Basin	Wyo.	Fremont	7/80	190	16	6	Frontier	S	22	144	1,300
Gulf	Quarantine Bay	La.	Plaquemines	11/81	200	5	3	3(RB)SU	S	27.4	50-2,000	8,200
Phillips	Huntington Beach	Calif.	Orange	6/78	65	8	4	Lower Main	S	24	150	3,800
Superior	Torrance	Calif.	Los Angeles	6/81	604	45	21	Main	S	31	220	3,500
Thums (City of Long Beach)	Wilmington	Calif.	Los Angeles	12/80	5	4	1	Tar	—	31.7	1,000	3,000
Unocal	Orcutt	Calif.	Santa Barbara	7/81	170	17	6	Pt. Sal	S	22.5	78	3,750
Unocal	South Van Unit	Tex.	Van Zandt	9/9/80	800	14	10	Lewisville	S	26	100	2,600
Unocal	Carroll Unit	Tex.	Van Zandt	11/81	212	7	6	Lewisville	S	26	100	2,600

Reservoir oil				Residual oil saturation, %						
°API	cp	@°F.	Previous prod.	Start	End	Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
42	0.3	240	WF	41	40	JS	2,000	0	TETT	Yes
40	1.8	125	WF	40	38.3	NC	78	28	Disc.	Yes
39	4	95	WF	34	32	HF	220	0	Prom.	Yes
39	3.2	96	WF	36	25	HF	770	0	Prom.	Yes
47	0.55	134	WF	52	46	JS	6,534	0	TETT	Yes
40	—	160	Prim.	—	—	JS	5	0	TETT	TETT
40	—	115	Prim.	—	—	NC	80	80	Succ.	Yes
25/26	24/15	95/103	WF	54/59	44/47	JS	3,700	0	TETT	TETT
23.5	4	168	WF	46	40	NC	1,850	0	TETT	TETT
38	1.0	141	WF	43	40	HF	968	10	Prom.	Yes
39	3	100	WF	51	48	HF	1,100	120	Prom.	Yes
33	10	80	WF	56	47	HF	1,000	100	Succ.	Yes
35	2.3	130	WF	—	—	JS	1,000	30	TETT	Yes
32	10	90	WF	50.7	43.4	JS	72	25	Succ.	Yes
25	20	95	WF	49	47.8	HF	1,088	128	Prom.	Yes
39.5	4	83	WF	30.9	28.5	HF	100	10	Prom.	Yes
33.4	4.8	159	WF	29.8	28.7	HF	568	0	Prom.	Yes
28	50	90	WF	48.9	47.8	JS	250	0	Prom.	Yes
40	3-4.4	82-104	WF	27.7	27.5	HF	3,810	400	Prom.	Yes
38	3.5	90	WF	27.2	26.7	HF	580	150	Succ.	Yes
37	5	88	WF	21	20	NC	84	0	Prom.	Yes
35	4	115	WF	54	52	HF	370	0	Prom.	Yes
22	60	124	Prim.	64	56	NC	130	120	Succ.	Yes
30	4.3	115	WF	39	37	JS	70	0	TETT	TETT
35	6	98	WF	40	39.8	NC	51	5	Succ.	Yes
35	8	92	WF	45	44	NC	85	0	Disc.	Yes
37	6	90	WF	60	58	HF	114	0	TETT	Yes
34	10	110	Prim.	57	55	JS	120	0	Prom.	TETT
36	4	100	WF	34	31	JS	130	0	TETT	TETT
40	2	113	WF	45	44.5	NC	200	70	Succ.	Yes
27	5	112	WF	49.3	43.5	JS	1,450	—	TETT	TETT
32	2.55	104	WF	58	48	JS	3,400	—	TETT	TETT
34	3.5	103	Prim./WF	43.6	42.4	JS	720	—	TETT	TETT
37	0.56	110	WF	55.5	46.9	JS	1,657	—	TETT	TETT
34.4	41.2	100	WF	36	—	HF	5	2	TETT	No
39	4.4	100	WF	50	—	JS	160	155	TETT	NO
38	2.9	97	Prim.	34	—	NC	40	40	NE	No
37	4	69	Prim./WF	33	—	Term 11/30/82	30	30	Disc.	No
32	7	110	WF	3.3	21.5	NC	425	425	Succ.	Yes
32	7	110	WF	35	25	Term 8/82	40	40	Disc.	No
30	20	65	WF	46	28	HF	130	100	TETT	No
39	4.4	100	WF	50	—	JS	—	—		
29	18	70	WF	45	—	JS	20	20	TETT	TETT
29	18	70	Prim./WF	45	—	JS	50	50	TETT	TETT
35	7	70	Prim./WF	40	—	JS	50	50	TETT	TETT
36	6	70	Prim./WF	40	—	NC	200	200	Prom.	No
35	7	70	Prim./WF	40	25	Term (12/76)	0	0	Prom.	No
21	11	185	WF	96	—	—	96	—	NE	TETT
43	0.323	191	WF	87	—	—	482	11	NE	TETT
39	3	120	WF	30	18	NC	75	20	Prom	Yes
45	5	68	Prim.	40	22	JS	60	0	TETT	NA
28	12	135	WF	50	45	NC	68	68	Disc.	No
31	16	85	WF	40	33.6	NC	42	32	Disc.	No
36	36	72	WF	30.5	15.3	HF	180	180	Prom.	No
31.4	2.2	200	Prim.	43	10	NC	200	0	Disc.	No
42	1.2	130	Prim.	82	28	HF	50	50	Succ.	Yes
20	30	120	WF	27	22	—				
20	30	120	JS	175	175	TETT	—			
16	220	85	Prim.	—	—	HF	198	90	Prom	—
33	5	182	Prim.	51	—	HF	Not Active	Not Active	Disc.	No
31	0.7	205	Prim./WF	70	55	NC	940	—	Prom.	TETT
33	1.4	83	WF	48	—	Term 12/82	—	—		—
33	1.4	83	WF	86	—	Term 7/83	—	—		—
22	82	76	WF	80	—	Term 12/82	—	—		—
16	220	85	Prim.	—	—	HF	—	—		—
33.2	4.85	182	Prim.	51	—	HF	—	—		—
22	15	165	WF	42	40	NC	325	60	Disc.	Yes
21	17	165	WF	40.7	39.6	JS	2,450	—	Prom.	Yes
12	1,000	104	Prim.	97	50	Term 85	70	60	Disc.	No
23.5	4	168	WF	46	44	Term 8/84	500	50	Disc.	No
35	2.3	130	WF	—	—	NC	143	5	Succ.	Yes
33	2.3	130	WF	—	—	NC	33	1	Succ.	Yes

CO_2, other gases continue gains

Operator	Field	State	County	Start date	Area, acres	Number wells		Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
						Prod.	Inj.					
CO_2 MISCIBLE												
Amoco	North Cowden Unit	Tex.	---	—	12	2	6	Grayburg	Dolo/LS	10	5.4	—
Amoco	Slaughter	Tex.	Hockley	12/84	5,700	—	—	San Andres	Dolo/LS	13	7	4,950
Amoco	Slaughter	Tex.	Hockley	12/84	1,600	64	37	San Andres	Dolo/LS	10	4	4,950
Amoco	Wasson		Yoakum	12/84	7,800	316	250	San Andres	Dolo/LS	9	5	5,100
Amoco	Levelland	Tex.	Hockley	3/73	13.2	2	6	San Andres	Dolo.	11.5	3.5	4,900
Amoco	Levelland	Tex.	Hockley	8/78	15	1	4	San Andres	Dolo.	11.8	3.8	4,900
Amoco	Slaughter	Tex.	Hockley	11/72	12.2	2	6	San Andres	Dolo.	10.5	4.3	4,950
Arco	Sho-Vel-Tum	Okla.	Stephens	9/82	1,100	65	43	Sims	S	16	70	6,200
Arco	Garber	Okla.	Garfield	10/81	80	9	4	Crew Sand	S	19	12	1,900
Arco	North Coles Levee	Calif.	Kern	6/1/81	70	8	3	Stevens Sand	S	19.5	9	9,000
Arco	Sable	Tex.	Yoakum	3/84	825	31	11	San Andres	Dolo.	8.4	1.5	5,200
Chevron	SACROC Unit	Tex.	Scurry	1/72	49,900	887	379	Canyon Reef	LS	3.93	19.4	6,700
Chevron	Pittsburg	Tex.	Camp	6/85	43	4	1	Pittsburg	Limey Sand	11	2.4	8,000
Chevron	University Waddell	Tex.	Crane	5/83	920	50	13	Devonian	Dolo.	12	14	8,500
Chevron	Kurten	Tex.	Brazos	8/81	672	5	4	Woodbine	S	12	0.4	8,300
Chevron	Quarantine Bay	La.	Plaquemines	10/81	57	4	1	4 Sand Reservoir	S	30	100-1,000	8,120
Chevron	Heidelberg	Miss.	Jasper	12/83	40	1	—	Eutaw	S	25	74	5,060
Chevron	Pittsburgh	Tex.	Camp	11/83	120	5	1	Sub-Clarksville	S	23	460	3,800
Cities Service	Welch	Tex.	Dawson	2/8/82	2,675	129	132	San Andres	LS	9.25	9	4,890
Cities Service	Northwest Purdy	Okla.	Garvin	9/82	8,320	106	102	Springer	S	13	44	9,400
Conoco	Maljamar MCA unit	N.M.	Lea	5/83	5	198	107	Grayburg/San Andres	S/LS	11.0	18	3,665
Conoco	West Sussex Unit	Wyo.	Johnson	12/82	10	3	1	Shannon	S	19.5	121	3,040
Conoco	Ford Geraldine Unit	Tex.	Reeves & Culberson	2/81	3,850	198	123	Delaware	S	23	64	2,680
Exxon	Means (San Andres)	Tex.	Andrews	11/83	6,700	248	176	San Andres	LS	9	20	4,300
Grace Petroleum	South Bishop Ranch	Wyo.	Campbell	1/82	1,280	5	4	Minnelusa	S	15	150	9,400
Grace Petroleum	South Bishop Ranch	Wyo.	Campbell	1/82	640	5	2	Minnelusa	S	16	50	9,200
HNG Fossil Fuels	Twofreds	Tex.	Loving, Ward & Reeves	1/74	4,392	42	33	Delaware	S	19.5	32	4,900
Highland Resources	Rose City North	Tex.	Orange	4/81	800	9	5	Hackberry	S	37	4,500	8,200
Mitchell Petroleum Corp.	Alvord South Field	Tex.	Wise	1980	2,291	245	10	Caddo	Conglomerate	12.8	55	5,700
Mobil	McElmo Creek Unit	Utah	San Juan	2/28/85	13,440	170	100	Ismay, Desert Creek	LS	14	5	5,600
Pennzoil	Tinsley	Miss.	Yazoo	11/6/81	1,338	21	—	Perry	S	26.4	49	4,800
Phillips	Vacuum	N.M.	Lea	2/81	4,900	237	97	San Andres	Dolo.	11.7	11	4,500
Petromac Inc.	Rankin	Tex.	Harris	1/81	80	6	1	Yegua	S	27	300	7,900
Santa Fe Energy	Raymond	Mont.	Sheridan	8/83	685	2	1	Nisku	LS	8.2	13	7,900
Shell Western E&P	Crossett	Tex.	Crane & Upton	4/72	1,500	23	11	Deronian	Tripolitic chert	22	5	5,300
Shell Western E&P	Wasson	Tex.	Yoakum	4/83	20,000	840	280	San Andres	Dolo.	12	8	5,200
Shell Western E&P	Little Creek Field	Miss.	Lincoln & Pike	12/85	8,200	110	40	Lower Tuscaloosa	S	23	33	10,640
Southland Royalty	McElroy	Tex.	Upton	2/81	640	38	20	San Andres	Dolo.	11.6	1.5	3,850
Texaxo	Bay St. Elaine	La.	Terrebonne	1/81	9	2	1	8,000-Foot	S	32.9	1,480	7,400
Texaco	Paradis	La.	St. Charles	2/82	347	12	4	Lower 9,000-Foot	S	26	770	10,400
Texaco	Paradis	La.	St. Charles	2/82	320	7	3	No. 8	S	27	795	8,600
Union Texas Petroleum	Wellman	Tex.	Terry	7/22/82	1,400	29	2	Wolfcamp	LS	4.15	100	9,800
Union Oil of Calif.	Dollarhide	Tex.	Andrews	5/29/85	6,183	62	43	Devonian	Dolo./Tripolite	13.5	17	8,000
CO_2 Immiscible												
Champlin	Wilmington	Calif.	Los Angeles	3/81	41	3	4	Tar	S	24	465	2,500
Champlin	Wilmington	Calif.	Los Angeles	2/84	156	10	12	Tar	S	24	465	2,500
Exxon	Pewitt Ranch	Tex.	Titus	6/83	—	1	—	Paluxy	S	24	1,000-1,500	4,500
Marathon Oil Co.	Yates	Tex.	Pecos & Crockett	11/25/85	14,300	895	13	Grayburg & San Andres	Dolo.	17	175	1,100-1,700
Phillips	Lick Creek	Ark.	Bradley-Union	1/76	1,640	39	13	Meakin	S	303	1,200	1,100-1700
Shell Western E&P	Weeks Island Field	La.	New Iberia	1979	8	2	1	S RES B	S	26	1,800	12,760
Texaco	Lafitte	La.	Jefferson Parish	8/84	271	5	2	8,900-Foot	S	27	250	8,900
Texaco	Cute Blanche Bay, West	La.	St. Mary Parish	3/84	55	3	3	14 Sand	S	29	322	8,000
Texaco	Bayou Sale	La.	St. Mary Parish	5/84	564	5	2	St. Mary Sand	S	31	500	10,000
Texaco	Paradis	La.	St. Charles Parish	3/84	110	2	2	Main Pay	S	28	1,033	10,200
Texaco	Lake Barre	La.	Terrebonne	3/84	1,164	12	4	Upper M	S	25	139	13,000
Texaco	South Marsh Island Block 6	La.	Offshore	6/85	82	2	1	Rob E-S	S	29.6	323	11,200
Texaco	West Delta Block 109	La.	Offshore	6/85	74	1	1	10,800-Foot	S	30	1,900	10,500
Texaco	West Delta Block 109	La.	Offshore	6/85	48	1	1	10,200-Foot	S	27	205	10,000
Texaco	West Delta Block 109	La.	Offshore	6/85	78	1	1	12,500-Foot	S	27	1,032	12,000
Texaco	West Delta Block 109	La.	Offshore	6/85	75	1	1	13,100-Foot	S	29.7	68	11,325
Texaco	Sho-Vel-Tum	Okla.	Stevens	5/83	120	2	—	Deese	S	13	100	5,530
Texaco	Talco	Tex.	Franklin	5/82	240	—	—	Paluxy	S	25	388	3,785
Texaco	Manvel	Tex.	Brazoria	11/83	128	—	—	Oligocene	S	30	1,000	5,000
Texaco	Manvel	Tex.	Brazoria	10/82	43	—	—	Oakville	S	30	400	4,000
Texaco	West Columbia	Tex.	Brazoria	6/83	33	—	—	PTSD	S	30	560	2,600
Texaco	Thompson	Tx.	Fort Bend	1/83	100	—	—	Frio	S	27	100-1,000	5,100
Texaco	Withers, North	Tex.	Wharton	3-17-83	454	—	—	Withers, N.	S	25	1,050	5,250
Texaco	Withers, North	Tex.	Wharton	5-26-83	768	—	—	C-Sand	S	25	400	5,320
Texaco	Plymouth	Tex.	San Patricio	10-21-83	380	—	—	Main Greta	S	31	350	4,650
Texaco	Pierce Ranch	Tex.	Wharton	1-18-83	480	—	—	Pierce Ranch	S	31.8	534	4,900
Texaco	Pickett Ridge	Tex.	Wharton	5-25-83	726	—	—	Pickett Ridge	S	30	1,200	4,600
Texaco	Magnet Withers, BH&S State Tracts J.E. Broussard, A. C. Thompson	Tex.	Wharton	10-17-83	1,224	—	—	Magnet Withers	S	23	1,700	5,500

Table H

°API	Reservoir oil cp	Reservoir oil @°F.	Previous prod.	Residual oil saturation, % Start	Residual oil saturation, % End	Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
34	1.67	94	WF	—	—	JS	22	—	TETT	—
31	1.4	105	WF	—	—	JS	7,500	—	Prom.	—
31	1.4	105	WF	—	—	JS	3,000	—	Prom.	—
32	1.3	110	WF	—	—	JS	13,000	—	Prom.	—
30	2.3	105	WF	74	—	HF	47	21	TETT	—
30	2.3	105	WF	43	—	HF	9	6	TETT	—
27	2	105	WF	61	—	NC	28	28	Succ.	—
25	3.3	115	WF	39	42	JS	2,500	750	Prom.	Yes
44	1.0	100	WF	30	15	NC	35	—	Succ.	Yes
36	0.45	235	Prim.	34	258	HF	150	—	Disc.	No
32	1.46	107	WF	—	—	JS	750	—	TETT	TETT
41	0.35	130	Prim/WF	55	25	NC	43,863	1,600	Succ.	Yes
41	0.35	130	WF	55	25	NC	43,863	16,000	Succ.	Yes
43	0.45	140	WF	71	—	JS	2,000	70	TETT	Yes
38	0.4	230	Prim.	40	—	JS	160	120	—	—
32	1	183	Prim.	55	—	HF	85	85	Prom.	No
20	15	150	Prim.	—	—	HF	Term 12/84			—
14	2,200	120	Prim.	—	—	JS	30	16	TETT	—
34	2.15	96	WF	30	18	HF	3,100	300	Succ.	No
38	1.2	148	WF	46	40	NC	3,500	950	TETT	TETT
36	0.8	90	Prim./WF	—	—	NC	50	50	—	—
38	1.7	93	—	—	—	Term.	79	79	—	—
40	1.4	83	Prim./WF	—	—	JS	395	395	Succ.	No
29	6	97	WF	—	—	JS	—	—	—	—
34	—	180	WF	—	—	JS	—	—	—	—
35	1.14	220	WF	—	—	JS	—	—	—	—
36	1.5	105	WF	—	—	HF	892	892	—	—
37	2	180	WF	50	35	HF	460	460	Prom.	No
44	0.39	154	WF	60	45	HF	680	200	Prom.	
41	0.50	125	Prim./WF	50	—	JS	5,600	—	TETT	TETT
39	1.5	175	WF	65	38	HF	400	400	Prom.	No
38	1	101	Prim.	70	50	JS	12,400	80	TETT	TETT
37	0.6	192	WF	55	25	JS	80	80	Prom.	No
40	0.4	178	Prim.	—	—	JS	86	46	prom.	Yes
44	0.36	106	Residue gas injection	34	22	HF	2,000	2,000	Succ.	Yes
33	1.3	105	WF	40	27	JS	46,000	1,200	Succ.	Yes
38	0.4	248	WF	21	2	JS	3,300	3,300	prom.	TETT
31	2.3	86	WF	—	—	Term	—	—	—	—
36	0.667	170	Prim.	20	5	NC	7	7	Disc.	No
37	0.5	205	Prim.	62	48	HF	575	575	prom.	No
39	0.4	192	Prim.	3	2	HF	400	400	prom.	No
43.5	0.54	151	WF	35	10	JS	7,000	—	TETT	TETT
40	0.44	122	Prim/WF	35	22	JS	1,900	—	TETT	TETT
14	283	123	WF	51	30	HF	170	170	Succ.	No
14	283	123	WF	51	30	JS	375	375	TETT	TETT
19	30	160	Prim.	—	—	JS	—	—	—	—
30	5.5	82	gas injection-pressure main.	—	—	JS	97,341	—	TETT	TETT
17	160	118	Prim.	55	46	NC	450	400	Succ.	Yes
32	0.5	225	WF	22	2	NC	160	160	Succ.	No
34	0.7	185	Prim.	50	45	JS	400	30	Succ.	Yes
32	1.3	184	WF	50	45	JS	80	10	prom.	Yes
34	0.4	194	Prim.	50	45	JS	2,000	30	Succ.	Yes
38	0.5	195	WF	50	45	JS	250	15	Succ.	Yes
33	0.4	236	WF	50	45	JS	650	50	Succ.	Yes
34.0	0.30	208	Prim.	50	45	JS	220	100	Succ.	Yes
36.5	0.28	200	Prim.	50	45	JS	2,200	300	Succ.	Yes
37.3	0.26	194	Prim.	50	45	JS	3,000	10	Disc.	Yes
34.1	0.25	218	Prim.	50	45	JS	1,600	—	Disc.	Yes
37	0.3	210	Prim.	50	45	JS	500	10	Succ.	Yes
24	18	129	Prim.	49	40	Term.	12	8	Prom.	Yes
23	25	147	Prim.	50	45	Term.	462	0	Disc.	No
26.7	7.2	149	Prim.	45	20	JS	550	30	Succ.	Yes
25	4.4	149	Prim.	42-65	variable	JS	127	—	—	—
30	8	116	Prim.	36-48	10-20	JS	290	9	Prom.	Yes
25.2	2.7	120	Prim.	42-65	variable	JS	93	3	Prom.	Yes
25.7	2.45	145	Prim.	35	32	HF	300	3.5	Prom.	Yes
25.3	2.9	147	WF	32	30	Term. 1/85	98	4	Disc.	No
23.3	3.19	150	Prim.	31.5	20	Term. 1/85	150	0	Disc.	No
244	4.57	155	Prim.	48	~~18~~	~~HF~~	429	1	Disc.	No
25	2.5	138	Prim.	29	28	HF	112	—	—	No
26	2.3	154	Gas Injection	35	31	JS	563	4.5	Succ.	Yes

CO$_2$, other gases continue gains....continued

Operator	Field	State	County	Start date	Area, acres	Number wells Prod.	Inj.	Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
Texaco	Magnet Withers, Pierce Estates B&C	Tex.	Wharton	7-27-83	500	—	—	—	S	23	1,700	5,500
Unocal	East Coyote-Hualde Dome Units	Calif.	Orange	6-82	766	92	21	1,2,3 Anaheim	S	26	400	3,300-4,600
HYDROCARBON MISCIBLE												
Amoco	Levelland	Tex.	Hockley	5/71	1,200	40	28	San Andres	Dolo.	10.2	2.1	4,900
Amoco	Slaughter	Tex.	Hockley	4/72	12.2	2	6	San Andres	Dolo.	10.5	4.3	5,000
Arco	Prudhoe Bay	Alaska	Prudhoe Bay	12/82	3,650	42	7	Sadlerochit	S	23	300	8,800
Arco	Chandeleur Sound Block 25	La.	—	1/83	1,670	52	11	BB	S	33	1,680	5,250
Arco	Chandeleur Sound Block 25	La.	—	1/83	200	6	2	4800 Ft. Sand	S	33	1,680	4,800
Arco	South Pass Block 61	South Pass Block 61 (OCS)		8/83	55	1	1	IRK2	S	30	10-100	4,900
Arco	South Pass Block 61	South Pass Block 61 (OCS)		8/83	39	1	1	UJ, RL	S	33	50-700	5,500
Arco	South Pass Block 61	South Pass Block 61 (OCS)		8/83	26	1	1	LL, RG	S	33	10-200	6,800
Arco	South Pass Block 61	South Pass Block 61 (OCS)		5/81	179	5	2	MM, RAAO	S	30	25-750	9,100
Arco	South Pass Block 61	South Pass Block 61 (OCS)		5/81	320	4	3	UM, RAAO	S	30	25-800	9,000
Arco	South Pass Block 61	South Pass Block 61 (OCS)		5/81	74	3	1	MM, RBB	S	30	25-750	6,400
Arco	South Pass Block 61	South Pass Block 61 (OCS)		5/81	133	4	2	UM, RBB	S	30	25-800	6,300
Arco	South Pass Block 61	South Pass Block 61 (OCS)		2/84	39	1	2	LLA, RT	S	30	50-100	8,500
Arco	South Pass Block 61	South Pass Block 61 (OCS)		10/84	67	2	2	LK2, RU	S	29	100-200	8,000
Arco	South Pass Block 61	South Pass Block 61 (OCS)		8/85	54	2	1	LL, RBB1, 2	S	30	25-250	5,750
Chevron	Swanson River	Alaska	—	11/83	2,660	41	7	Hemlock	Congl.	21	143	10,300
Chevron	Swanson River	Alaska	—	11/83	2,660	41	7	Hemlock	Cong.	21	143	10,300
Exxon	South Pass Block 89	Tex.	Gulf of Mexico	12/83	—	16	10	X and Y Series	S	31	10-1,500	11,270
Exxon	Wasson	Tex.	Yoakum	7/85	1,923	106	107	San Andres	Dolo.	8.6	1.9	4,500
Exxon	Slaughter	Tex.	Hockley	5/85	569	19	11	San Andres	Dolo.	12.5	6.3	4,900
Exxon	Means	Tex.	Andrews	11/83	8,700	438	184	San Andres	Dolo.	9	20	4,300
Hunt	Fairway	Tex.	Anderson-Henderson	3/66	22,618	118	64	James	LS	11.1	11	9,900
Mitchell Energy Corp.	Alvord (3,000 Ft. Strawn)	Tex.	Wise	7/20/80	217	6	3	Bryson	S	20	46	3,000
Phillips	Bridger Lake	Utah	Summit	4/70	3,800	6	1	Dakota	S	12.8	79	15,600
Sun E&P Co.	Fordoche W-12	La.	Pt. Coupee	5/80	3,400	14	5	Wilcox	S	19	4.6	13,650
Sun E&P Co.	Fordoche W-8	La.	Pt. Coupee	5/80	3,300	20	3	Wilcox	S	20	8.6	13,200
True Oil Co.	Red Wing Creek	N. Dak.	McKenzie	1/1/82	640	8	1	Mission Canyon	LS	10	0.1	9,000
NITROGEN												
Chevron (tfb)	East Painter	Wyo.	Uinta	11/83	1,500	19	5	Nugget	S	11	.3	12,000
Chevron (tfb)	Painter	Wyo.	Uinta	6/80	1,600	38	18	Nugget	S	11.9	4.1	11,500
Exxon	Blackjack Creek	Fla.	Santa Rosa	2/81	4,600	8	8	Smackover	LS	16	112	15,700
Exxon	Jay-Little Escambia Creek	Fla.-Ala.	Santa Rosa-Escambia	1/81	14,415	85	33	Smackover	LS	14	35	15,400
Exxon	Fanny Church	Ala.	Escambia	1985	600	3	1	Smackover	LS	12	4.5	15,565
Gulf	Stonebluff	Okla.	Wagoner	3/82	540	45	26	Dutcher	S	16	100	1,200
Phillips	Andector Ellenburger	Tex.	Ector	11/81	1,931	43	3	Ellenburger	Dolo.	3.8	2,000	8,835
Texaco	Vealmoor, East	Tex.	Borden-Howard	12/81	3,353	40	7	Canyon	LS	9.5	38	7,350
Unocal	Chunchula Fieldwide Unit	Ala.	Chunchula	4-1-82	23,279	35	9	Smackover Carbonate	Dolo.	12.35	10	18,500†
FLUE GAS												
Arco	Block 31	Tex.	Crane	6/49	7,840	188	73	Devonian	LS	12	10	8,500
Exxon	Hawkins	Tex.	Wood	4/77	10,590	450	40	Woodbine	S	28	3,400	4,530
Phillips	Binger	Okla.	Caddo	1977	12,960	77	26	Marchand	S	7.5	0.2	10,000
CARBONATED WATERFLOOD												
Amoco	San Andres	Calif.	Fullerton	10/85	1,600	40	32	San Andres	LS Dolo.	13	1.4	4,500

Combustion projects underway in U.S.

Operator	Field	State	County	Start date	Area, acres	Number wells Prod.	Inj.	Pay zone	Formation type	Porosity, %	Permeability, md	Depth, ft
Bayou State	Bellevue	La.	Bossier	1970	180	126	24	Nacatoch	S	32	650	400
Bayou State	Caddo Pine Island	La.	Caddo	1979	20	13	3	Nacatoch	S	30	500	1,050
Chevron	W. Heidelberg CottonValley Unit	Miss.	Jasper	12/71	352	10	3	Cotton Valley 4 & 5	S	14	85	11,300
Cities Service	Bellevue	La.	Bossier	1971	180	174	50	Nacatoch	S	33.9	700	350-400
Greenwich	Forest Hill	Tex.	Wood	8/76	1,900	62	6	Harris	S	28	943	5,000
Gulf	W. Heidelberg Cotton Valley Unit	Miss.	Jasper	12/71	352	14	3	Cotton Valley 4&5	S	14	85	11,300
Lawrence-Allison	Teapot Dome, NPR-3	Wyo.	Natrona	9/80	10	9	8	Shannon	S	18	135	270-425
Marathon	Main Consolidated	Ill.	Crawford	10/61	517	51	5	Robinson	S	19.7	320	900
Mobil	West Newport	Calif.	Orange	1958	300	139	36	Miocene	S	37	500-1,000	1,600
Mobil	San Ardo	Calif.	Monterey	2/74	182	25	5	Aurignac	S	34.5	3,000	2,300
Mobil	Midway-Sunset	Calif.	Kern	1/60	150	29	6	Moco	S	36	1,500	2,700
Mobil	Midway-Sunset	Calif.	Kern	1/67	390	17		Webster	S	33	2,000	1,600
Mobil	South Belridge	Calif.	Kern	1964	245	25	2	Tulare	S	35	3,000	—
Mobil	Lost Hills	Calif.	Kern	4/61	164	34	5	Tulare	S	42.6	1,790	300
Petromac	Slocum	Tex.	Elkhart	4/80	50	20	7	Carrizo Wilcox	S	35	1,500	570
Santa Fe Energy	Midway-Sunset	Calif.	Kern	1982	112	2-1/58	3/14	Potter	S	30-35	200-400	1,700+
Texaco	Camp Hill	Tex.	Anderson	9/85	17.4	29	6	Carrizo	S	38	4,000	500
Texaco	Bellevue	La.	Bossier	9/63	700	334	115	Nacatoch	S	33	960	350
Unocal	Brea-Olinda	Calif.	Orange	3/72	17.1	12	2	1st Miocene	S	29	300	3,000
Unocal	Brea-Olinda	Calif.	Orange	5/80	45	12	1	3rd Pliocene	S	30	725	2,200
W. Newport Oil Co.	W. Newport (B Zone)	Calif.	Orange	1958	300	130	27	Miocene	S	37	500-1,000	1,600

Table H

Reservoir oil °API	cp	@°F.	Previous prod.	Residual oil saturation, % Start	End	Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
26	2.3	154	Gas Injection	35	34	JS	200	17	Succ.	Yes
23	12	130	WF	N/A	N/A	Term	1,600	—	Disc.	No
30	2.3	105	Prim.	90	—	HF	2,300	1,200	Succ.	—
28	1.9	105	WF	58	—	NC	13	9	Succ.	—
27	0.9	200	Prim.	65	30	JS	65,000	—	Prom.	TETT
27	3.45	132	Prim.	45	30	JS	4,400	2,900	Succ.	Yes
27	3.5	130	Prim.	45	30	JS	450	350	Succ.	Yes
39	0.70	150	Prim.	65	25	HF	200	100	Succ.	Yes
40	0.40	150	Prim.	77	26	HF	1,280	1,200	Succ.	Yes
43	0.40	170	Prim.	73	31	HF	170	130	Succ.	Yes
38	0.30	190	WF	76	26	HF	3,225	2,130	Succ.	Yes
38	0.30	190	WF	78	25	HF	4,460	2,830	Succ.	Yes
37	0.70	165	WF	78	27	HF	4,000	3,150	Succ.	Yes
37	0.70	165	WF	78	27	HF	2,350	2,075	Succ.	Yes
33	0.86	190	Prim.	70	30	HF	330	250	Succ.	Yes
36	0.50	180	Prim.	67	27	HF	1,400	1,400	Succ.	Yes
29	1.70	158	Prim.	66	28	JS	1,600	1,240	TETT	—
36.7	1.0	180	Immiscible nat. gas	32.5	30.1	JS	—	—	—	—
37	1	180	HC Immisc.	33	30	JS	5,649	TETT	—	
38-40	0.4-0.6	165	Prim.	—	—	JS	—	—	TETT	TETT
33	1.0	106	WF	—	—	JS	—	—	TETT	TETT
32	1.3	110	WF	—	—	JS	—	—	TETT	TETT
29	6	97	WF	—	—	JS	—	—	TETT	TETT
48	0.15	260	Prim.	73	36	NC	8,600	8,600	Succ.	Yes
41	0.95	107	WF	37	32	NC	4	4	Disc.	No.
40	0.36	225	Prim.	70	61	NC	550	550	Succ.	Yes
45	0.126	274	—	—	—	HF	374	—	Succ.	Yes
44	0.126	267	—	—	—	HF	903	—	Succ.	Yes
40	0.25	241	Prim.	60	20	JS	1,500	0	NE	Yes
46	0.2	185	HC gas cycling	98.5	52	JS	—	—	—	—
46	0.2	174	HC gas cycling	98.4	35	JS	—	—	—	—
48	0.3	286	WF	59	—	JS	3,600	1,500	Prom.	—
51	0.2	285	WF	59	46	JS	20,800	7,600	Prom.	Yes
51	0.15	288	Prim.	76	—	JS	—	—	TETT	TETT
38	5	85	Gas recycle	67	—	JS	—	—	—	Yes
44	0.6	132	Prim.	43.8	37	JS	7,500	—	Prom.	Yes
43	1.2	155	WF	66	42	NC	2,835	—	Disc.	—
54	0.176	325	Prim.	80	45	JS	10,500	3,150	Prom.	Yes
46	9	130	Prim.	—	—	NC	10,500	8,400	Succ.	Yes
24	3.7	168	Prim.	—	—	HF	—	15,000	Succ.	Yes
38	0.3	190	Prim.	98	75	HF	2,750	2,750	Succ.	Yes
32	—	100	—	—	—	JS	1,300	—	TETT	TETT

Table I

Reservoir oil °API	cp	@°F.	Previous prod.	Residual oil saturation, % Start	End	Project maturity	Total prod. bo/d	Enhanced prod. bo/d	Project eval.	Profit
19	660	—	Prim.	94	49	HF	600	470	Succ.	Yes
21	620	80	Prim.	96	48	JS	100	84	Prom.	No
18-27	6	221	Prim.	80	—	NC	748	748	Succ.	Yes
19	576	75	Prim.	72	32	HF	600	600	Succ.	Yes
10	1,006	185	Prim.	65	33	JS	550	550	Succ.	No
18-27	5	221	Prim.	80	—	NC				
32	10	61	Prim	40	12-15	JS				
29	35	65	Prim./WF	78	—	NC	80	80	Prom.	Yes
13	750	100	Prim.	86	37	HF	1,900	1,900	Succ.	Yes
12	300	130	Steam soak	55	39	Term. 4/85	360	360	Succ.	Yes
14	110	125	—	99	52	HF	616	616	Succ.	Yes
14	600	113	Prim.	89	69	Term.	0	0	Succ.	Yes
14	1,600	95	Prim.	64	35	NC	400	320	Succ.	Yes
15	410	95	Prim.	63	22	NC	450	450	Succ.	Yes
18	1,200	78	—	70	20	JS	70	70	Prom.	No
11.5	97	210	Prim/Drive/Cyclic	81.1	<10	JS	400	250	TETT	TETT
18	1,200	75	Prim.	59	25	JS	29	—	TETT	TETT
19	675	130	Prim.	60	28.5	NC	2,500	2,500	Succ.	Yes
24	20	135	Prim.	—	—	Term. 11/82	139	0	Prom.	Yes
16	90	109	Prim.	—	—	NC	174	74	Prom.	Yes
13	750	100	Prim.	86	37	HF	1,700	1,200	Succ.	Yes

OGJ-MORGAN PIPELINE COST INDEX—GAS
4th QTR 1985

Pipeline costs edge up after 2 flat years

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Declining crude-oil prices and lower U.S. interest rates in the final quarter combined to turn 1985 into a year of unexpectedly strong growth for U.S. gas-pipeline construction.

Nevertheless, construction costs for 1985, as measured by the fourth quarter 1985 OGJ-Morgan gas-pipeline composite cost index, increased by a moderate 2.55% (Table 1, Fig. 1).

During 1985, a total of 84 gas-pipeline-construction projects was submitted to the U.S. Federal Energy Regulatory Commission (FERC). Of this total, 71 were onshore gas-transmission lines and 13 offshore gas-gathering lines.

The totals in miles of pipelines proposed in 1985 were 2,438 and 152, respectively. Total projected cost for the onshore projects was $678.8 million; for offshore, $46.2 million. These projects totaled $725 million.

A summary of these projects is contained in Tables 3 and 4.

Gas-pipeline cost components. A review of the five major gas-pipeline cost components shows moderate price increases that range from 0.48% to 1.53% for fourth quarter 1985.

Line pipe showed the sharpest increase (1.53%) during the quarter.

Pipeline installation together with compressor equipment and drive units had the smallest price increase of 0.48%. Similarly, line-pipe coating had a moderate increase of 0.53%.

High-pressure gas station piping increased 1.01%, mainly due to the sharply increased cost of line pipe.

The overall cost increase for these five major cost components was 0.806%, reflecting a gradual increase in the cost of gas-pipeline construction for the fourth quarter of 1985.

Steel line pipe (gas). Construction cost estimates reported to the FERC in 1985 by interstate gas-transmission pipelines show the volume of line pipe comparable to that reported in 1984. For 1985, 813,090 tons were reported, compared to 869,065 tons in 1984. The line pipe reported in 1985 ranged in diameter from 4 in. through 42 in. with about 90% of the total tonnage attributable to the superinch (26 to 42 in.) pipelines.

Comparing the companies' cost estimates to the quoted mill prices indicates an average 1985 price of $859.71/ton for all sizes of pipe included in the gas line-pipe inventory (Table 2). This price represents an increase of 3.1% when compared to the previous year's average cost of $833.75/ton.

Preliminary gas-pipeline cost estimates do not always consider the actual discounts being alloted by the domestic steel mills. Consequently, adjustments must be made to the estimated costs to reflect current market conditions. The annual index for steel line pipe (gas) reflects consideration given to the 1985 gas-pipeline cost estimates together with the appropriate average mill discount prices for each size of line pipe included in the gas-pipeline inventory.

The weighted average 1985 cost of

Table 1

OGJ-Morgan gas-pipeline cost indexes (1976 = 100)

	Yearly indexes*								1985			
Cost component	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**	**1st qtr.**	**2nd qtr.**	**3rd qtr.**	**4th qtr.**
1. Steel line pipe	105	121	137	158	187	193	188	193	194	196	196	199
2. Valves and fittings (gas)	105	120	135	155	181	186	182	187	188	189	189	194
3. Pipeline installation	110	122	137	156	180	193	200	204	205	206	207	208
4. Line pipe coating	109	119	131	146	163	171	178	183	184	185	188	189
5. Compressor equipment & drive units	115	131	149	163	181	196	203	207	208	209	209	210
6. High-pressure gas station piping	107	121	137	153	179	192	192	197	198	199	200	202
7. Plant piping	108	123	136	158	181	192	194	199	200	201	202	204
8. Mechanical equipment	106	114	123	135	151	162	167	169	170	171	171	172
9. Electrical equipment	106	114	123	134	146	155	161	164	165	166	166	167
10. Compressor & auxiliary buildings	107	115	125	135	146	152	158	162	163	164	165	166
11. Measurement & regulating station equipment	106	116	126	140	155	166	170	174	175	176	176	177
12. Communication equipment	107	113	120	134	147	154	159	163	164	165	166	167
13. Transportation equipment	106	115	128	142	156	165	174	178	180	182	184	186
Total composite index	**108**	**122**	**137**	**156**	**180**	**190**	**192**	**196**	**197**	**199**	**199**	**201**

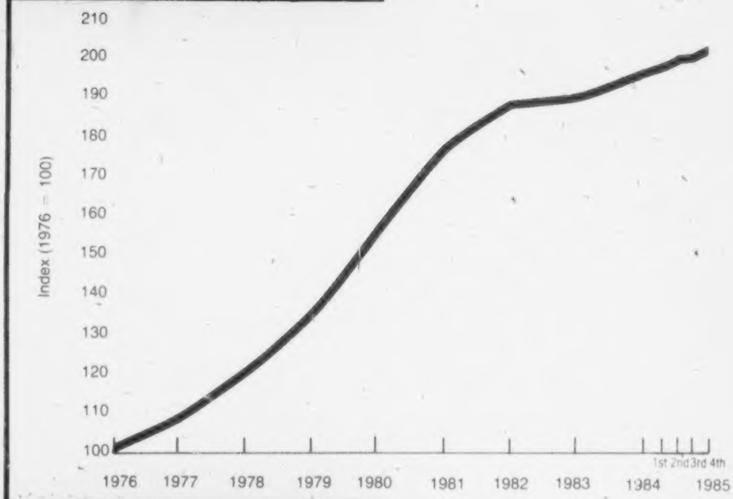
*Index shown for each year is that of final quarter.

Figs. 1-2

1985 spurs cost trends up again

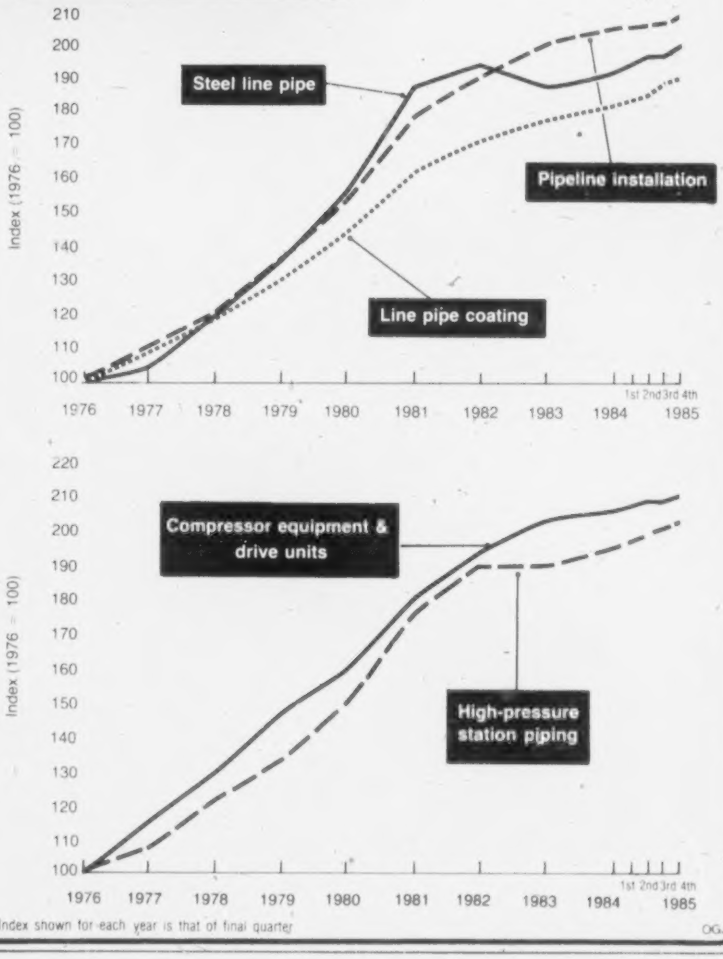
OGJ-Morgan composite index*

Fig. 1



Component indexes*

Fig. 2



*Index shown for each year is that of final quarter

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$859.71/ton was compared to the weighted 1976 base-period cost of $432.10/ton to produce an annual index of 199 (Table 2, Fig. 2).

Pipe coating. Total installed cost of all types of pipe coating showed an increase of 0.53% during fourth quarter 1985.

Material costs for coal tar products, concrete, and tape materials increased by 0.575%. The labor and machinery costs for installing these items showed a modest increase of 0.25%. Weighting the material and labor costs together produces a coating increase of 0.53% and a corresponding index of 189 for fourth quarter 1985 (Table 1, Fig. 2).

Pipeline installation. Labor and machinery costs for installing steel line pipe comprise the cost component of pipeline installation.

The contractor's cost for laying steel line pipe is predicated on three major cost subcomponents:

1. Composite cost of common and skilled pipeline labor
2. Cost of construction machinery and equipment
3. Miscellaneous materials, fuel, insurance, taxes, etc.

- Labor rates. Skilled and common laborers kept wage demands to a modest level in 1985.

Engineering News-Record (ENR) reported that its 20-city average wage for carpenters, bricklayers, and ironworkers climbed 1.4% over 1984 as compared with an almost 6% increase only 2 years ago. This left the average skilled pay at $20.97/hr, only $0.13 higher than a year ago.

Skilled heavy-equipment operators, in strong demand from busy road-building contractors, showed annual pay increases ranging from 5 to 9% for 1985.

Based on the national pipeline labor agreements, pipeline union wage rates increased approximately 0.45% during fourth quarter 1985.

Quarterly common-labor rates increased from $12.95/hr to $13.02/hr, representing a modest increase of 0.525%. However, operating engineers' rates increased only 0.35%, from $19.84/hr to $19.91/hr during the quarter. These wage rates do not reflect the 32% reduction made in some states and areas on construction projects 16 in. and less in size (OGJ, Mar. 25, 1985, p. 128).

- Machinery. The Bureau of Labor Statistics' (BLS) price index for construction machinery and equipment declined 0.5% in the last 3 months of 1985.

That price decline helped offset a slight gain in the previous quarter and was enough to limit 1985's annual BLS price-index gain to 1.3%, com-

20 years of oil-pipeline-construction cost indexes*

Cost components	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Steel line pipe	66	64	65	64	66	71	73	78	100	140	144	139	160	172	197	219	215	212	218	225
Line pipe fittings	65	64	65	65	67	72	73	79	100	137	141	138	159	169	193	214	209	207	213	219
Pipeline construction	57	59	62	65	69	76	82	89	100	113	120	128	140	156	174	195	207	214	219	224
Pipe coating†	—	—	—	—	—	—	—	—	100	111	117	124	135	148	163	181	190	194	202	209
Masonry buildings	77	79	81	81	84	76	81	82	100	102	109	118	127	138	149	162	168	174	179	182
Metal or asbestos-clad steel frame buildings	71	74	76	76	77	80	85	92	100	108	112	119	128	137	147	159	164	169	172	176
Stationary engines and reciprocating pumps	69	71	73	76	80	83	86	90	100	122	135	144	156	176	197	220	238	240	245	250
Electric motors—100 hp and up & large centrifugal pumps	77	79	83	82	82	84	86	88	100	125	145	159	185	213	234	256	273	278	284	290
Portable & misc. units	66	69	72	76	80	83	85	89	100	125	136	144	156	175	194	213	227	231	233	237
Electric starters & switchgear	72	76	80	83	83	83	87	91	100	113	120	127	134	143	156	172	183	190	195	199
Shop machinery & tools	77	78	80	81	85	88	90	91	100	124	133	146	155	170	192	215	234	246	256	264
Oil pipe and fittings in place	61	62	63	65	68	74	78	84	100	125	131	133	149	163	184	205	208	211	216	221
Steel storage tanks	54	53	61	63	70	76	81	83	100	113	130	140	157	174	190	208	218	220	226	231
Firewalls and misc.	54	53	61	63	70	76	81	83	100	113	130	140	157	174	190	208	218	220	226	231
Radio and microwave equipment	89	89	91	93	96	96	93	93	100	104	107	115	121	127	143	157	165	171	175	179
Office furniture and equipment	78	79	80	82	83	86	86	91	100	114	116	122	130	141	150	162	172	180	185	189
Autos, tractors & trucks	80	81	84	87	89	92	95	95	100	113	118	125	135	151	168	183	192	201	208	216
Other work equipment	76	77	77	79	83	86	89	91	100	124	134	146	155	171	193	213	230	242	252	257

*Oil and gas pipeline, 1966-1975; oil only, 1976-1985; gas only, see Table 1, this article. Indexes here are measured on 1974 dollars, or a base period of 1974 = 100. Index shown for each year is that of the final quarter. For indexes 1948-1965, see OGJ, May 12, 1980, p. 128. †No indexes were developed for pipe coating before 1974.

Note: To raise any year's dollar estimate to a more current year, divide the current year's index by a prior year's index to obtain a ratio. For example, to raise steel line pipe costs from 1970 to 1982, divide $\frac{\text{1982 Index}}{\text{1970 Index}} = \frac{215}{66}$ → ratio of 3.256 × \$193.82/ton (1970 cost) = \$631.08/ton (1982 cost).

Table 2

Steel line pipe (gas) 1985 cost estimates, average annual prices, and 1976 weighted average price

	Inventory			1985 cost estimates				
Diameter, in.	Mileage	Tonnage	% by tons	Footage	Tonnage	Avg. cost, $	Avg. mill price, $	1976 avg. cost, $
4	18,957	462,358	1.44	81,840	441.53	577.53	772.50	487.68
6	4,466	223,657	0.70	31,000	564.05	471.59	680.65	432.03
8	4,466	291,228	0.91	20,592	174.41	624.95	669.41	422.23
10	13,396	1,103,429	3.44	79,200	2,167.70	1,044.94	679.67	406.23
12	6,535	855,039	2.66	649,413	12,711.65	925.91	634.03	395.15
14	6,535	941,432	2.93	—	—	—	628.30	389.39
16	7,996	1,321,019	4.11	1,047,930	22,496.37	720.59	594.13	370.88
18	7,997	1,490,241	4.64	—	—	—	824.12	442.91
20	10,662	2,212,365	6.89	211,705	10,881.37	820.61	822.00	426.90
22	11,506	2,630,847	8.20	3,700	184.85	1,167.13	890.91	460.17
24	11,507	2,874,449	8.95	709,947	31,933.06	1,028.58	877.81	432.07
26	13,124	3,555,817	11.08	—	—	—	871.75	438.35
28	13,123	3,833,097	11.94	—	—	—	849.05	438.39
30	17,498	5,481,074	17.07	4,859,714	259,568.38	753.06	826.35	433.43
32	3,249	1,086,401	3.39	—	—	—	787.86	442.22
34	3,249	1,155,117	3.60	—	—	—	749.37	436.05
36	3,249	1,223,833	3.81	4,476,638	328,975.09	979.38	772.11	435.05
40	3,250	1,361,653	4.24	—	—	—	796.00	437.18
42	—	—	—	1,378,842	142,991.98	613.07	801.95	—
Totals	**160,765**	**32,103,056**	**100.00**	**13,550,521**	**813,090.45**	**\$859.71**		**\$432.10**

1985 Index = $\frac{\text{1985 average cost/ton}}{\text{1976 weighted avg. cost/ton}} = \frac{\$859.71}{\$432.10} = 199$

Table 3

1985 gas-pipeline projects—offshore

No. of projects	Size of line, in.	Length of project, miles	Cost/ft (range),$	Total cost,$
1	6	5.87	28.98	898,400
1	10	15.00	27.76	2,198,300
3	12	37.30	33.57-63.95	7,935,700
3	20	10.38	167.15-167.89	9,163,846
5	24	83.91	37.76-700.30	26,036,821
13		**152.46**	**57.43**	**46,233,067**

Table 4

1985 gas-pipeline projects—onshore

No. of projects	Size of line, in.	Length of project, miles	Cost/ft (range),$	Total cost,$
1	4	15.50	2.28	186,500
2	8	33.90	5.80-13.69	1,200,000
6	12	85.70	23.19-28.20	11,715,800
8	16	198.48	9.20-71.04	13,579,570
6	20	42.94	24.50-99.28	15,771,982
1	22	0.70	411.30	1,521,800
9	24	68.79	19.20-174.01	22,460,454
29	30	920.20	27.56-122.69	223,742,920
7	36	846.42	51.85-247.51	336,765,438
2	42	261.14	36.82-74.30	51,848,926
71		**2,437.77**	**52.74**	**678,793,390**

pared with a 1.7% increase in 1984. A number of equipment lines contributed to the overall quarterly decline.

Some of the deepest price cuts were for large hydraulic dozers that declined an average of 0.8% in the last quarter of 1985.

A long list of construction equipment posting no price changes in the final quarter helped contribute to the overall moderation. Almost every type of tractor reported by BLS showed stable prices in the quarter.

This, combined with no tractor price hikes in the third quarter 1985, left prices for most capacity types below those averaged in 1984.

- Miscellaneous materials. Materials furnished by the pipeline contractors including lumber, concrete, and steel showed a range of price fluctuations from −2.64% to +1.84% during fourth quarter 1985.

Fuel costs continued to decline or hold steady in various areas of the country. Other miscellaneous costs for insurance and taxes, however, continued to rise 1.75% and 0.5%, respectively. Consideration of all these data indicates that the overall cost of pipeline installation increased about 0.48% during fourth quarter 1985. Therefore, the index for pipeline installation increased from 207 to 208 (Table 1, Fig. 2).

Compressor, drive units. The composite cost index for compressor equipment and drive units increased a modest 0.48% for fourth quarter 1985.

The materials components included in the index reacted as follows: compressors, +0.61%; electric motors, +0.31%; reciprocating engines, −0.21%; and turbines, +0.40%.

The corresponding labor cost for installing these units increased by 0.25%. Weighting these factors together produces a quarterly increase of 0.48% and a corresponding index of 210 for fourth quarter 1985 (Table 1, Fig. 2).

Station piping. Total installed cost of high-pressure gas station piping includes the material and installation costs for large-diameter line pipe located in the compressor-station area together with valves, fittings, and controllers. Costs for these units are collected separately or in lump sum as reported in the construction cost estimates furnished to the FERC.

A weighted average of material, freight, and labor costs indicates that the total installed cost of high-pressure gas station piping increased by 1.01% for fourth quarter 1985. Therefore, the quarterly index increased from 200 to 202 (Table 1, Fig. 2).

Editors note: This is the final installment of the OGJ-MORGAN PIPELINE COST INDEX—GAS series which began in the Journal Sept. 20, 1982. The final installment of the series for oil-pipeline construction costs, which had its inception in the Journal Nov. 19, 1979, appeared Aug. 18, pp. 66-68.

The box on the previous page shows the component indexes for oil-pipeline construction costs for the past 20 years. Table 1 provides the complete component indexes for gas-pipeline construction costs for 9 years. ■

OGJ-MORGAN PIPELINE COST INDEX—OIL

4th QTR 1985

1985 construction costs keep pace

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Oil-pipeline construction costs for fourth quarter 1985 and thus for the entire year, as measured by the OGJ-Morgan Pipeline Cost Index, continued the moderate escalation evident earlier in the year and in 1984.

A significant factor in this moderation was the relatively low cost of borrowing construction funds. These rates remained stable as the threat of interest rates' creeping back up failed to materialize in the year's final quarter. Rates on various loan instruments were their lowest in years.

The composite cost index for building oil pipelines showed an increase of 1.36% during fourth quarter 1985 and a total increase of 2.75% for the entire year (Table 1, Fig. 1). This increase is in line with 1984's pace (2.8%) and reflects continued stability in oil-pipeline construction costs (OGJ, Aug. 12, 1985, pp. 97-101).

Major cost components. Material prices in fourth quarter 1985 showed a gradual increase as manufacturers realigned their pricing schedules for the major steel components.

The cost of steel line pipe and line pipe fittings increased 1.8% and 1.9% respectively. The installed cost of pipe coating posted a moderate incease of 0.97%.

The installed cost of large electric motors and pumps had a minor increase of 0.33%.

Completing the list of major cost components: Steel storage tanks increased 0.87%; pipeline construction costs, 0.90% (Table 1, Fig. 2).

FERC decision. On June 28, 1985, the Federal Energy Regulatory Commission (FERC) issued Opinion 154-B in the Williams Pipe Line Co. rate proceeding, adopting a rate making methodology for oil pipelines that includes a trended original cost approach for determining rate base and case-specific procedures for determining a real rate of return on equity.

In selecting a starting rate base, the FERC used a middle-ground approach between valuation and net depreciated original cost.

The reproduction portion of the rate base formula is extracted from the 1983 pipeline valuations completed by the FERC. The original-cost portion of the formula is taken from the pipeline's accounting records or books on that date.

In subsequent years, all new pipeline assets will be added to the rate base at original cost and trended with an appropriate index. However, for existing assets that are currently valued under the valuation formula, a one-time adjustment would be necessary to arrive at an appropriate base to be trended for the future.

Since the FERC decided that the 1983 pipeline valuations would be the starting and ending point for the rate-base calculations, it was no longer necessary to develop and issue oil-pipeline valuations. Therefore, all common carriers were relieved from filing yearly cost data reports and final project valuation data subsequent to 1983.

Oil-pipeline construction projects are, therefore, no longer detailed in FERC records. Previous yearly report-

Table 1

OGJ-Morgan oil-pipeline cost indexes (1974 = 100)

	Yearly indexes*					1985			
Cost component	1980	1981	1982	1983	1984	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.
1. Steel line pipe	197	219	215	212	218	219	221	221	225
2. Line pipe fittings	193	214	209	207	213	214	215	215	219
3. Pipeline construction	174	195	207	214	219	220	221	222	224
4. Pipe coating	163	181	190	194	202	203	204	207	209
5. Masonary buildings	149	162	168	174	179	180	181	182	182
6. Metal or asbestos clad steel frame buildings	147	159	164	169	172	173	174	174	176
7. Stationary engines and reciprocating pumps	197	220	238	240	245	246	248	249	250
8. Electric motors—100 hp & up &—large centrifugal pumps	234	256	273	278	284	286	288	289	290
9. Portable and miscellaneous units	194	213	227	231	233	234	235	236	237
10. Electric starters & switchgear	156	172	183	190	195	196	197	198	199
11. Shop machinery and tools	192	215	234	246	256	258	260	262	264
12. Oil pipe and fittings in place	184	205	208	211	216	217	218	219	221
13. Steel storage tanks	190	208	218	220	226	227	228	229	231
14. Firewalls and miscellaneous	190	208	218	220	226	227	228	229	231
15. Radio & microwave equipment	143	157	165	171	175	176	177	178	179
16. Office furniture & equipment	150	162	172	180	185	186	187	188	189
17. Autos, tractors, and trucks	168	183	192	201	208	210	212	214	216
18. Other work equipment	193	213	230	242	252	253	254	255	257
Total composite	**185**	**205**	**210**	**212**	**218**	**219**	**220**	**221**	**224**

*Index shown for each year is that of final quarter. For indexes 1948-1979, see OGJ, May 11, 1981, p. 101.

1985 index advance continues 1984 pace

Figs. 1-2

Fig. 1

OGJ-Morgan composite index*

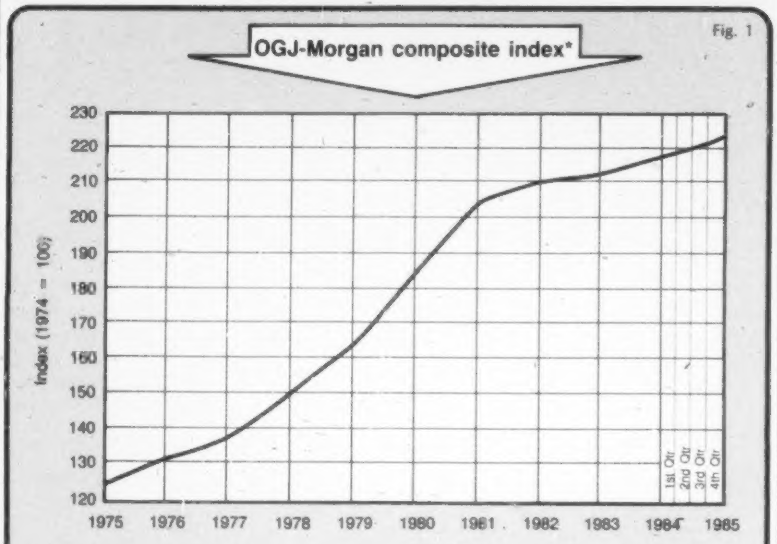
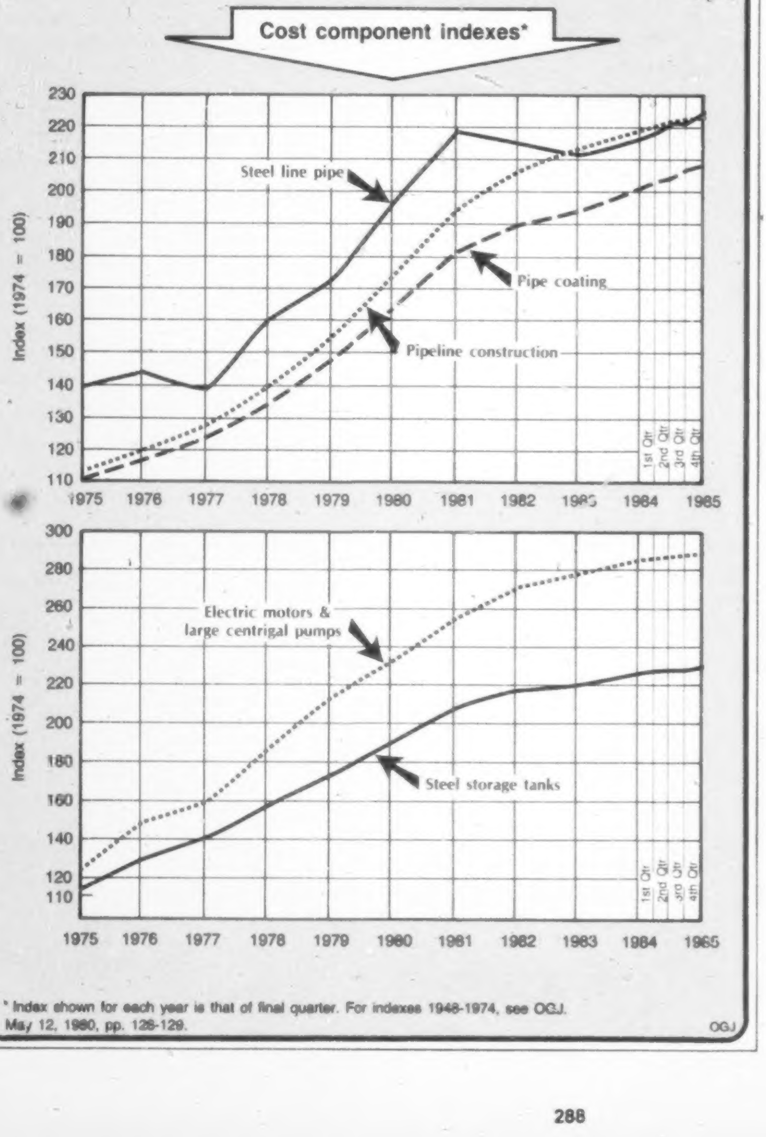


Fig 2

Cost component indexes*



* Index shown for each year is that of final quarter. For indexes 1948-1974, see OGJ, May 12, 1980, pp. 128-129.

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ing of line pipe, pipeline construction projects, and erection costs of oil steel storage tanks are no longer available to OGJ for its yearly report.

Steel line pipe. On Nov. 15, 1985, U.S. Steel Corp. advised it would eliminate deep discounts while reducing prices for a line of pipe products. The effect was a hike in prices. The nation's No. 1 steelmaker said that effective Jan. 6, 1986, it would trim published prices for its continuous weld and seamless standard and line-pipe products lines.

Price reductions would range from 10% to 19%. At that time, however, pipe customers were paying prices less than new list prices.

By eliminating discounts, U.S. Steel sought to raise the steeply discounted prices to new list-price levels. The steelmaker said its actions were to bring published prices for these products "more in line with the realities of the market place."

Previously in 1985, U.S. Steel had established similar new pricing procedures for sheet-steel products in September, for plate and oil-drilling products in October, and for bar and semi-finished items earlier in November.

A review of line pipe purchased by common carrier oil pipelines in 1985 indicated an increase in price of 3.2% over 1984's prices. Therefore, the line pipe index was increased to 225 for fourth quarter 1985 (Table 1, Fig. 2).

Pipeline construction. Labor and machinery costs for installing steel line pipe, generally below ground, comprise the pipeline construction cost component. Contractors' costs for laying steel line pipe are predicated on three major cost subcomponents:

1. Composite cost of common and skilled pipeline labor.
2. Cost of construction machinery.
3. Miscellaneous materials, fuel, insurance, taxes, etc.

- *Labor rates.* The construction trades, still fighting to gain market share lost to open-shop contractors, continued in 1985 to post moderate gains in wage and fringe benefits.

Deferred increases and newly negotiated pacts left common pipeline-labor wage and fringe benefits averaging about 2% higher than in 1984. Common laborers in some areas with slumping construction activity found their hourly pay about the same as 1984 or even less. Skilled workers also keep new wage demands to a modest level.

Welders' wages remained at the same level as in 1984, whereas operating engineers' hourly rates increased only 1.4%. The pickup and bus teamsters' rates showed the largest yearly increase of 1.9% from $14.53/hr in 1984 to $14.80/hr in 1985. These figures do not include the 32% reduction made in some states and areas on pipeline construction projects 16 in. and under.

- *Machinery.* The Bureau of Labor Statistics (BLS) price index for construction machinery and equipment declined 0.5% in the last three months of 1985. That price decline helped offset a slight gain in the earlier quarter and was enough to limit 1985's BLS price index gain to 1.3%.

A number of equipment lines contributed to the overall quarterly decline. Some of the deepest price cuts were for large hydraulic dozers that declined 0.8%.

Joining the downward trend in the last quarter were excavators and off-highway dump trucks. Prices for both these items were rolled back an average of 0.2% between September and December 1985.

- *Miscellaneous materials.* Materials furnished by the pipeline contractors including lumber, concrete, and steel showed a range of price fluctuations from −2.64 to +1.84% during fourth quarter 1985. Fuel costs continued to decline or hold steady in various areas of the country. Other miscellaneous costs for insurance and taxes, however, continued to rise approximately 1.75% and 0.5%, respectively.

Consideration of all these data indicates that the the overall cost of pipeline construction increased 0.90% during fourth quarter 1985. Therefore, the index for pipeline construction increased from 222 to 224 (Table 1, Fig. 2).

Pipe coating. Coating costs have been summarized earlier (OGJ, Nov. 4, 1985, pp. 99-101).

A review of the varous components shows material cost increases of 0.575% and machinery application cost increases of 0.91%.

Weighting these two components together produces a quarterly cost increase of 0.729%. Therefore, the index for pipe coating increased from 207 to 209 for fourth quarter 1985 (Table 1, Fig. 2).

Pumping units. Composite cost index for large electric motors, 100 hp and up, and large centrifugal pumps increased about 0.33% during fourth quarter 1985. Material components in this index increased by 0.573%, whereas labor costs to install these units increased only 0.055% during the construction period.

Weighting these factors together produces a quarterly increase of 0.33% and a corresponding index of 290 for fourth quarter 1985 (Table 1, Fig. 2).

Steel storage tanks. Total cost of erecting large-diameter oil-storage tanks is predicated on five major subcomponents: engineering and design; materials costs of carbon-steel plates; shop fabrication labor; freight or shipping charges; and field erection costs.

A review of the quarterly prices for the cost components reveals the following: engineering and design work increased 2.5%; carbon steel plates, 1.75%; welders' and structural irons workers' wages showed no increase and a decrease of 0.18%, respectively; and freight costs did not increase during the quarter.

A weighted average of material, freight, and labor costs reveals total erected tank costs increased by 0.87% over third quarter 1985, so the index for steel storage tanks increased from 229 to 231 for fourth quarter 1985 (Table 1, Fig. 2).

Semiannual. Planned future installments of the OGJ-Morgan Oil-Pipeline Cost Index will appear on a semiannual basis, beginning with the one for first half 1986.

Initial appearance of the index on this basis is scheduled for early 1987. Indexes will continue to be developed for the 18 cost components of oil-pipeline construction. ■

How indexes have changed

Gerald L. Farrar
Contributing Editor

The accompanying table shows comparisons of refinery-construction and refinery-operating wages monthly for the years 1984 and 1985.

The Nelson refinery construction cost indexes are inflation indexes, whereras the operating indexes have a productivity factor which shows improvement with experience and increasing size of operations.

As might be expected, the refinery construction wages shown in the table show a steady advance over the 2-year period, with the composite wage varying from 1,263.3 in January of 1984 to 1,301.1 in December in 1985.

In contrast to this, the refinery operations labor cost actually decreased over the period, from 342.7 in January of 1984, to 273.1 in December of 1985.

Thus it is seen that 1984 and 1985 were years of relatively stable labor costs in the refining field. •

Table 1

Refinery construction and operating wages

		Skilled	Common	Composite	Wages	Productivity	Labor cost
1984	Jan	1,134.4	1,502.4	1,263.2	643.2	187.7	342.7
	Feb	1,135.0	1,502.4	1,263.6	626.8	202.9	308.9
	Mar	1,138.3	1,504.4	1,266.4	631.5	199.9	315.9
	Apr	1,138.3	1,506.3	1,267.1	639.5	201.5	317.4
	May	1,140.6	1,513.1	1,271.0	622.8	206.9	301.0
	June	1,144.4	1,525.7	1,277.9	620.3	208.4	297.6
	July	1,145.6	1,528.6	1,279.7	619.5	203.7	304.1
	Aug	1,159.4	1,533.4	1,290.3	622.9	209.5	297.3
	Sept	1,160.6	1,536.3	1,291.1	637.9	212.3	300.5
	Oct	1,157.8	1,530.5	1,288.2	632.6	206.8	303.3
	Nov	1,157.8	1,531.5	1,288.6	639.7	208.1	307.0
	Dec	1,157.8	1,531.5	1,288.6	622.7	206.2	302.0
	Year	1,147.5	1,520.5	1,278.1	629.9	204.5	308.0
1985	Jan	1,161.7	1,540.2	1,294.2	641.3	199.3	321.8
	Feb	1,165.6	1,538.2	1,296.0	634.3	202.5	313.2
	Mar	1,160.6	1,540.2	1,293.5	632.2	202.0	313.0
	Apr	1,160.6	1,540.2	1,293.5	658.3	211.9	310.7
	May	1,165.5	1,549.9	1,300.0	621.7	212.6	292.4
	June	1,167.2	1,548.6	1,300.8	638.3	218.3	292.4
	July	1,167.2	1,548.9	1,300.8	631.0	223.2	282.7
	Aug	1,163.9	1,546.0	1,297.6	627.4	220.9	284.0
	Sept	1,166.7	1,544.0	1,298.8	660.6	229.1	283.4
	Oct	1,167.8	1,541.1	1,298.5	649.0	237.0	273.8
	Nov	1,165.0	1,542.1	1,296.9	651.7	237.0	274.7
	Dec	1,165.0	1,553.7	1,301.1	662.3	242.5	273.1
	Year	1,165.0	1,544.5	1,297.6	642.3	219.7	293.4

Itemized refining cost indexes

The cost indexes may be used to convert prices at any date to prices at other dates by ratios to the cost indexes of the same date. Item indexes are published each quarter (first week issue of January, April, July, and October). In addition the Nelson Construction and Operating Cost indexes are published in the first issue of each month of The Oil and Gas Journal.

Operating cost (based on 1956 = 100.0):	1954	1972	1983	1984	1985	May, 1986	* References	Index for earlier year in Costimating and Questions on Technology issues
Power, industrial electrical	98.5	131.2	508.4	537.2	558.5	564.8	Code 0543	No. 13, May 19, 1958
Fuel, refinery price	85.5	152.0	869.4	921.3	836.2	515.0	Oil & Gas J.	No. 4, Mar. 17, 1958
Gulf cargoes	85.0	130.4	1213.1	1288.7	1088.4	610.7	Oil & Gas J.	No. 4, Mar. 17, 1958
N.Y. barges	82.6	169.6	1062.2	1123.7	998.4	665.9	Oil & Gas J.	No. 4, Mar. 17, 1958
Chicago low sulfur			1078.1	1191.0	1143.2	857.6	Oil & Gas J.	July 7, 1975
S. Pedro bunkers	84.3	168.1	1195.0	1260.5	[illegible]94.8	463.0	Oil & Gas J.	No. 4, Mar. 17, 1958
Oklahoma, northern shipments	60.2	128.1	1316.9	1385.6	1248.1	665.0	Oil & Gas J.	No. 4, Mar. 17, 1958
Natural gas at wellhead	83.5	190.3	2249.5	2236.[illegible]	2171.1	2004.8	Code 531-10-1	No. 4, Mar. 17, 1958
Inorganic chemicals	96.0	123.1	381.6	38[illegible].4	389.7	384.6	Code 613	Oct. 5, 1964†
Acid, hydrofluoric	95.5	144.4	406.6	407.5	407.5	407.5	Code 613-0222	Apr. 3, 1963†
Acid, sulfuric	100.0	140.7	363.3	352.9	363.3	363.3	Code 613-0281	No. 94, May 15, 1961
Platinum	92.9	121.1	465.8	405.8	283.9	411.4	Code 1022-02-73	July 5, 1965, p. 117
Sodium carbonate	90.9	119.4	383.0	351.0	343.2	338.7	Code 613-01-03	No. 58, Oct. 12, 1959
Sodium hydroxide	95.5	136.2	453.2	359.7	366.7	309.0	Code 613-01-04	No. 94, May 15, 1961
Sodium phosphate	97.4	107.0	481.6	492.5	530.2	530.2	Code 613-0267	No. 58, Oct. 12, 1959
Organic chemicals	100.0	87.4	332.1	339.6	320.2	292.0	Code 614	Oct. 5, 1964†
Furfural	94.5	137.5	550.0	550.0	556.8	576.9	Chemical Marketing Reporter	No. 58, Oct. 12, 1959
MEK, tank-car lots	82.6	87.5	301.4	300.0	300.0	300.0	Chemical Marketing Reporter	No. 58, Oct. 12, 1959
Phenol	90.4	47.1	193.9	213.3	229.3	161.2	Code 614-0241	No. 58, Oct. 12, 1959
TEL	102.8	101.6	307.6	334.8	430.0	516.0	Supplier	No. 58, Oct. 12, 1959

Itemized refining cost indexes (continued)

Operating cost (based on 1956 = 100.0):	1954	1972	1983	1984	1985	May, 1936	* References	Index for earlier year in Costimating and Questions on Technology issues
Operating labor cost (1956 = 100)								
Wages & benefits	88.7	210.0	621.9	629.9	642.3	634.6	Employ & Earn	No. 41, Feb. 16, 1969
Productivity	97.2	197.0	186.7	204.5	219.7	262.9	Employ & Earn	No. 41, Feb. 16, 1969
Construction labor cost (1946 = 100)								
Skilled const.	174.6	499.9	1106.1	1147.5	1165.0	1178.3	Eng. News Record	No. 55, Nov. 3, 1949
Common labor	192.1	630.6	1473.7	1520.5	1544.5	1567.3	Eng. News Record	No. 55, Nov. 3, 1949
Refinery cost	183.3	545.9	124.38	1278.1	1297.6	1314.5	Oil & Gas J.	May 15, 1967
Equipment or materials (1946 = 100):								
Bubble tray	161.4	324.4	788.5	818.3	824.5	812.4	Computed	July 8, 1962, p. 113
Building materials (nonmetallic)	143.6	212.4	547.8	567.7	585.3	595.9	Code 13	No. 61, Dec. 15, 1949
Brick—building	144.7	252.5	698.5	724.4	743.2	771.9	Code 1341	No. 20, Mar. 3, 1949
Brick—fireclay	193.1	322.8	858.0	906.8	928.4	933.9	Code 135	May 30, 1955†
Castings, iron	188.1	274.9	840.5	863.7	871.5	874.4	Code 1015‡	Apr. 1, 1963†
Clay products (structural, etc.)	159.1	342.0	572.6	592.2	610.5	636.1	Code 134	No. 20, Mar. 3, 1949
Concrete ingredients	141.1	218.4	541.1	561.9	566.3	583.3	Code 132	No. 22, March 17, 1949
Concrete products	138.5	199.6	479.6	492.4	509.4	517.0	Code 133	Oct. 2, 1967, p. 112
Electrical machinery	159.9	216.3	469.0	486.5	497.0	503.2	Code 117	May 2, 1955†
Motors and generators	157.7	211.0	563.5	583.3	601.8	603.7	Code 1173	No. 31, May 19, 1949
Switchgear	171.2	271.0	647.3	665.7	676.6	695.8	Code 1175	May 2, 1955†
Transformers	161.9	149.3	358.9	363.1	373.2	374.0	Code 1174	No. 31, May 19, 1949
Engines (combustion)	150.5	233.3	653.7	663.1	666.7	677.0	Code 1194	No. 36, June 23, 1949
Exchangers (composite)	171.7	274.3	541.7	530.9	520.0	518.0	Manufacturer	Mar. 16, 1964†
Copper base	190.7	266.7	502.0	495.5	504.3	507.3	Manufacturer	Mar. 16, 1964†
Steel	156.8	281.9	569.1	555.3	530.7	525.3	Manufacturer	Mar. 16, 1964†
Fractionating towers	151.0	278.5	663.4	674.9	677.7	673.3	Computed	June 8, 1963, p. 133
Hand tools	173.8	346.5	932.3	965.3	1008.3	1031.1	Code 1042	June 27, 1955†
Instruments (composite)	154.6	328.4	675.2	696.7	713.7	732.6	Manufacturer	No. 34, June 9, 1949
Insulation (composite)	198.5	272.4	948.2	1057.9	1088.8	1088.8	Manufacturer	Apr. 3, 1961, p. 193†
Lumber (composite)	197.8	353.4	784.7	779.6	756.3	781.9	Code 81	No. 7, Dec. 2, 1948
Southern pine	181.2	303.9	640.8	640.2	599.3	635.8	Code 811–02	No. 7, Dec. 2, 1948
Redwood, all heart	238.0	310.6	1154.8	1089.9	1052.4	1108.2	Code 811-03-16	July 5, 1965, p. 117
Machinery:								
General purpose	159.9	278.5	701.1	714.2	730.8	740.1	Code 114	Feb. 17, 1949
Construction	165.9	324.4	907.7	924.3	935.9	945.4	Code 112	Apr. 1, 1968, p. 184
Oilfield	161.9	269.1	902.3	898.3	900.1	895.9	Code 1191	Oct. 10, 1955†
Paints—prepared	159.0	231.8	520.6	534.3	545.6	551.7	Code 621	May 16, 1955†
Pipe:								
Clay sewer	140.1	207.4	440.4	441.4	—	—	Code 1345-01-01	No. 22, Mar. 17, 1949
Gray iron pressure	195.0	346.9	1071.8	1101.4	1156.9	1187.4	Code 1015-0239	Jan. 3, 1983
Standard carbon	182.7	319.9	879.4	923.3	937.0	855.2	Code 1017-0611	Jan. 3, 1983
Pumps, compressors, etc.	166.5	337.5	944.5	950.5	969.0	978.5	Code 1141	No. 29, May 5, 1949
Steel-mill products	187.1	330.6	894.4	927.4	926.4	883.3	Code 1017	Jan. 3, 1983
Alloy bars	198.7	349.4	884.2	896.3	846.7	826.3	Code 1017-0831	Apr. 1, 1963†
Cold-rolled sheets	187.0	365.5	974.4	1027.2	1023.3	951.7	Code 1017-0711	Jan. 3, 1983
Alloy sheets	177.0	225.9	450.1	472.6	479.3	471.7	Code 1017-0733	Jan. 3, 1983
Stainless strip	169.0	221.2	439.0	495.2	479.3	484.4	Code 1017-0755	Jan. 3, 1983
Structural carbon, plates	193.4	386.7	1018.7	1048.4	1047.5	967.6	Code 1017-0400	Jan. 3, 1983
Seamless carbon tubing	199.4	347.3	922.9	865.8	882.8	779.3	Code 1017-0621	Jan. 3, 1983
Welded carbon tubing	180.0	265.5	843.7	929.6	936.5	929.8	Code 1017-0622	Jan. 3, 1983
Tanks and pressure vessels	147.3	246.4	591.0	589.9	587.8	584.7	Code 1072	No. 5, Nov. 18, 1949
Tube stills	123.0	125.3	324.0	339.0	340.5	330.3	Computed	Oct. 1, 1962†
Valves and fittings	197.0	350.9	938.8	966.3	992.9	1008.6	Code 11-49-01	No. 46, Sept. 1, 1940
Nelson Refinery (Inflation Index)	179.8	438.5	1025.8	1061.0	1074.4	1080.5	Oil & Gas J.	May 15, 1969
Nelson Refinery Operation (1956)	88.7	118.5	412.9	417.4	406.8	363.0	Oil & Gas J.	No. 2, Mar. 3, 1958
Nelson Refinery Process Operation (1956)	88.4	147.0	565.5	584.2	551.7	424.2	Oil & Gas J.	No. 2, Mar. 3, 1958

*Code refers to the index number of the Bureau of Statistics, U.S. Department of Labor, "Wholesale Prices." †Questions of Technology or itemized Cost Indexes. The Oil and Gas Journal. ‡Revised, using only part of items listed under code number.

Hughes rig count

	1-27-86	1-28-85
Alabama	22	18
Alaska	21	24
Arkansas	17	32
Arizona	0	0
California	64	98
Land	54	79
Offshore	10	19
Colorado	52	55
Florida	6	5
Illinois	17	32
Indiana	2	7
Kansas	77	105
Kentucky	2	5
Louisiana	236	343
North	22	39
S. Inland Waters	32	52
S. Land	69	105
Offshore	113	147
Maryland	0	0
Michigan	46	30
Mississippi	23	33
Montana	21	25
Nebraska	7	12
New Mexico	54	60
New York	2	7
North Dakota	39	37

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	1-27-86	1-28-85
Ohio	27	57
Oklahoma	235	297
Pennsylvania	22	41
South Dakota	1	7
Texas	560	789
Offshore	36	56
Inland Waters	4	5
Dist. 1 & 4	62	99
Dist. 2 & 3	79	112
Dist. 5 & 6	75	81
Dist. 7B & 9	61	110
Dist. 7C,8 & 8A	218	280
Dist. 10	25	46
Utah	25	36
West Virginia	13	26
Wyoming	71	112
Others–Hi -1, Id -2, Nv -4, Va -2	9	10
Total U.S.	**1,671**	**2,303**
Cum. Avg. to Date	**1,809**	**2,420**
Canada	460	365
Canada-Offshore	6	11
Grand Total	**2,137**	**2,679**

Rotary rigs from spudding in to total depth

Hughes rig count

	3-31-86	4-1-85
Alabama	10	22
Alaska	17	21
Arkansas	14	29
Arizona	0	0
California	57	75
Land	49	65
Offshore	8	10
Colorado	24	56
Florida	2	5
Illinois	2	15
Indiana	1	3
Kansas	50	86
Kentucky	2	5
Louisiana	157	291
North	12	21
S. Inland Waters	16	47
S. Land	43	87
Offshore	86	136
Maryland	0	0
Michigan	18	10
Mississippi	21	33
Montana	12	22
Nebraska	3	5
New Mexico	38	70
New York	1	2
North Dakota	8	34

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	3-31-86	4-1-85
Ohio	7	17
Oklahoma	169	250
Pennsylvania	17	31
South Dakota	0	0
Texas	342	693
Offshore	19	61
Inland Waters	4	3
Dist. 1 & 4	48	87
Dist. 2 & 3	49	101
Dist. 5 & 6	58	80
Dist. 7B & 9	34	83
Dist. 7C,8 & 8A	116	241
Dist. 10	14	37
Utah	6	22
West Virginia	14	32
Wyoming	30	74
Others–Id -2, Nv -5, Tn -1, Va -4	12	7
Total U.S.	**1,034**	**1,910**
Cum. Avg. to Date	**1,439**	**2,166**
Canada	219	227
Canada-Offshore	3	8
Grand Total	**1,256**	**2,145**

Rotary rigs from spudding in to total depth

Hughes rig count

	5-26-86	5-27-85
Alabama	9	22
Alaska	12	15
Arkansas	6	26
Arizona	0	0
California	41	65
Land	35	55
Offshore	6	10
Colorado	10	32
Florida	2	4
Illinois	6	36
Indiana	1	3
Kansas	38	91
Kentucky	2	8
Louisiana	110	273
North	7	25
S. Inland Waters	16	44
S. Land	33	80
Offshore	54	124
Maryland	0	0
Michigan	23	38
Mississippi	17	34
Montana	6	20
Nebraska	1	5
New Mexico	18	68
New York	3	5
North Dakota	4	37

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	5-26-86	5-27-85
Ohio	9	21
Oklahoma	114	251
Pennsylvania	11	18
South Dakota	0	0
Texas	234	642
Offshore	20	47
Inland Waters	3	0
Dist. 1 & 4	30	82
Dist. 2 & 3	38	86
Dist. 5 & 6	32	84
Dist. 7B & 9	36	88
Dist. 7C,8 & 8A	65	215
Dist. 10	10	40
Utah	6	20
West Virginia	9	18
Wyoming	22	84
Others–Ga -1, Nv -4, Tn -1, Va -9	15	12
Total U.S.	**72y**	**1,848**
Cum. Avg. to Date	**1,212**	**2,052**
Canada	36	230
Canada-Offshore	7	11
Grand Total	**772**	**2,089**

Rotary rigs from spudding in to total depth

Hughes rig count

	2-24-86	2-25-85
Alabama	19	21
Alaska	23	23
Arkansas	19	28
Arizona	0	0
California	60	79
Land	49	60
Offshore	11	19
Colorado	34	50
Florida	4	6
Illinois	6	20
Indiana	1	7
Kansas	57	92
Kentucky	2	3
Louisiana	201	300
North	8	32
S. Inland Waters	28	45
S. Land	58	90
Offshore	107	133
Maryland	0	0
Michigan	41	37
Mississippi	20	36
Montana	18	19
Nebraska	5	8
New Mexico	38	71
New York	1	6
North Dakota	17	36

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	2-24-86	2-25-85
Ohio	15	44
Oklahoma	180	270
Pennsylvania	26	49
South Dakota	0	1
Texas	436	783
Offshore	25	62
Inland Waters	3	5
Dist. 1 & 4	60	98
Dist. 2 & 3	59	121
Dist. 5 & 6	61	94
Dist. 7B & 9	41	100
Dist. 7C,8 & 8A	170	266
Dist. 10	17	37
Utah	17	36
West Virginia	9	25
Wyoming	47	87
Others–Id -2, Nv -7, Va -3	12	6
Total U.S.	**1,308**	**2,143**
Cum. Avg. to Date	**1,626**	**2,304**
Canada	440	389
Canada-Offshore	8	9
Grand Total	**1,756**	**2,541**

Rotary rigs from spudding in to total depth

Hughes rig count

	4-28-86	4-29-85
Alabama	13	18
Alaska	16	18
Arkansas	8	19
Arizona	0	0
California	48	-66
Land	39	57
Offshore	9	9
Colorado	15	39
Florida	1	4
Illinois	6	34
Indiana	1	4
Kansas	44	86
Kentucky	3	5
Louisiana	131	285
North	5	23
S. Inland Waters	16	42
S. Land	42	85
Offshore	68	135
Maryland	0	0
Michigan	24	21
Mississippi	21	35
Montana	7	22
Nebraska	3	8
New Mexico	25	66
New York	1	2
North Dakota	4	28

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	4-28-86	4-29-85
Ohio	6	7
Oklahoma	142	271
Pennsylvania	2	8
South Dakota	0	1
Texas	285	672
Offshore	23	52
Inland Waters	3	2
Dist. 1 & 4	25	79
Dist. 2 & 3	48	96
Dist. 5 & 6	50	89
Dist. 7B & 9	32	97
Dist. 7C,8 & 8A	85	220
Dist. 10	19	37
Utah	5	30
West Virginia	6	19
Wyoming	25	77
Others–Id -1, Nv -4, Tn -1, Va -7	13	10
Total U.S.	**855**	**1,855**
Cum. Avg. to Date	**1,313**	**2,096**
Canada	33	99
Canada-Offshore	6	8
Grand Total	**894**	**1,962**

Rotary rigs from spudding in to total depth

Hughes rig count

	6-30-86	7-1-85
Alabama	9	24
Alaska	18	18
Arkansas	6	28
Arizona	0	0
California	39	66
Land	37	57
Offshore	2	9
Colorado	14	38
Florida	2	6
Illinois	5	33
Indiana	1	3
Kansas	40	93
Kentucky	3	8
Louisiana	98	272
North	6	23
S. Inland Waters	14	50
S. Land	37	76
Offshore	41	123
Maryland	0	0
Michigan	17	36
Mississippi	14	30
Montana	4	30
Nebraska	3	7
New Mexico	16	72
New York	2	4
North Dakota	8	34

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	6-30-86	7-1-85
Ohio	11	28
Oklahoma	98	245
Pennsylvania	15	26
South Dakota	0	1
Texas	224	658
Offshore	16	52
Inland Waters	2	4
Dist. 1 & 4	26	91
Dist. 2 & 3	33	87
Dist. 5 & 6	31	66
Dist. 7B & 9	30	90
Dist. 7C,8 & 8A	75	226
Dist. 10	11	42
Utah	8	21
West Virginia	13	27
Wyoming	18	87
Others–Ga -1, Id -1, Nv -2, Va -7	11	9
Total U.S.	**697**	**1,904**
Cum. Avg. to Date	**1,114**	**2,016**
Canada	68	316
Canada-Offshore	6	9
Grand Total	**771**	**2,229**

Rotary rigs from spudding in to total depth

Hughes rig count

	7-28-86	7-29-85
Alabama	7	30
Alaska	10	18
Arkansas	7	21
Arizona	0	0
California	34	76
Land	33	67
Offshore	1	9
Colorado	13	34
Florida	2	6
Illinois	4	31
Indiana	0	3
Kansas	39	104
Kentucky	2	5
Louisiana	109	260
North	10	23
S. Inland Waters	18	43
S. Land	34	80
Offshore	47	114
Maryland	0	0
Michigan	17	38
Mississippi	16	25
Montana	3	28
Nebraska	2	6
New Mexico	15	66
New York	1	3
North Dakota	8	37

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	7-28-86	7-29-85
Ohio	15	28
Oklahoma	117	233
Pennsylvania	15	26
South Dakota	0	3
Texas	230	662
Offshore	15	43
Inland Waters	1	3
Dist. 1 & 4	27	73
Dist. 2 & 3	39	102
Dist. 5 & 6	36	76
Dist. 7B & 9	32	85
Dist. 7C,8 & 8A	73	238
Dist. 10	7	42
Utah	7	22
West Virginia	15	24
Wyoming	18	87
Others–Ga.-1,Id.-1, Nv.-3,Va.-5	10	14
Total U.S.	**716**	**1,890**
Cum. Avg. to Date	**1,057**	**2,002**
Canada	63	330
Canada-Offshore	6	10
Grand Total	**785**	**2,230**

Rotary rigs from spudding in to total depth

Hughes rig count

	9-29-86	9-30-85
Alabama	7	22
Alaska	8	23
Arkansas	5	26
Arizona	0	1
California	48	76
Land	45	66
Offshore	3	10
Colorado	18	58
Florida	1	8
Illinois	2	32
Indiana	2	2
Kansas	50	102
Kentucky	2	10
Louisiana	122	256
North	15	15
S. Inland Waters	18	41
S. Land	33	76
Offshore	56	124
Maryland	0	0
Michigan	20	45
Mississippi	7	36
Montana	5	18
Nebraska	2	5
New Mexico	21	73
New York	2	9
North Dakota	15	50

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	9-29-86	9-30-85
Ohio	22	20
Oklahoma	117	233
Pennsylvania	20	35
South Dakota	0	1
Texas	256	626
Offshore	14	48
Inland Waters	2	3
Dist. 1 & 4	37	68
Dist. 2 & 3	33	88
Dist. 5 & 6	43	78
Dist. 7B & 9	35	69
Dist. 7C,8 & 8A	73	243
Dist. 10	19	29
Utah	10	24
West Virginia	14	29
Wyoming	23	101
Others–Id.-1,Va.-5, Or.-1	7	14
Total U.S.	**806**	**1,935**
Cum. Avg. to Date	**985**	**1,985**
Canada	109	256
Canada-Offshore	1	9
Grand Total	**916**	**2,200**

Rotary rigs from spudding in to total depth

Hughes rig count

	11-24-86	11-25-85
Alabama	9	23
Alaska	7	19
Arkansas	5	20
Arizona	0	0
California	50	85
Land	46	74
Offshore	4	11
Colorado	26	63
Florida	1	12
Illinois	2	21
Indiana	2	3
Kansas	51	89
Kentucky	4	6
Louisiana	114	259
North	11	17
S. Inland Waters	18	44
S. Land	29	78
Offshore	56	120
Maryland	0	0
Michigan	17	33
Mississippi	9	34
Montana	11	25
Nebraska	2	5
New Mexico	30	80
New York	4	5
North Dakota	15	54

	11-24-86	11-25-85
Ohio	27	34
Oklahoma	135	242
Pennsylvania	24	32
South Dakota	2	1
Texas	327	634
Offshore	17	36
Inland Waters	3	4
Dist. 1 & 4	49	74
Dist. 2 & 3	45	92
Dist. 5 & 6	41	59
Dist. 7B & 9	43	80
Dist. 7C ,8 & 8A	110	259
Dist. 10	19	30
Utah	11	27
West Virginia	20	34
Wyoming	38	96
Others–Ia.-1, Va.-7 Or.-1	9	10
Total U.S.	**952**	**1,946**
Cum. Avg. to Date	**963**	**1,970**
Canada	129	379
Canada-Offshore	1	6
Grand Total	**1,082**	**2,331**

Hughes rig count

	8-25-86	8-26-85
Alabama	3	24
Alaska	10	21
Arkansas	11	22
Arizona	0	0
California	36	89
Land	35	80
Offshore	1	9
Colorado	22	55
Florida	1	6
Illinois	4	41
Indiana	0	5
Kansas	28	98
Kentucky	2	8
Louisiana	117	275
North	19	29
S. Inland Waters	14	41
S. Land	30	80
Offshore	54	125
Maryland	0	0
Michigan	18	34
Mississippi	14	21
Montana	6	20
Nebraska	2	9
New Mexico	14	64
New York	2	6
North Dakota	12	48

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	8-25-86	8-26-85
Ohio	15	31
Oklahoma	103	242
Pennsylvania	19	25
South Dakota	0	1
Texas	227	634
Offshore	11	37
Inland Waters	1	4
Dist. 1 & 4	26	77
Dist. 2 & 3	37	89
Dist. 5 & 6	41	71
Dist. 7B & 9	29	78
Dist. 7C,8 & 8A	71	241
Dist. 10	11	37
Utah	12	23
West Virginia	13	27
Wyoming	28	97
Others–Id.-1,Tn.-1, Va.-6	8	14
Total U.S.	**727**	**1,940**
Cum. Avg. to Date	**1,018**	**1,994**
Canada	111	296
Canada-Offshore	2	11
Grand Total	**840**	**2,247**

Rotary rigs from spudding in to total depth

Hughes rig count

	10-27-86	10-28-85
Alabama	12	22
Alaska	8	18
Arkansas	8	24
Arizona	0	1
California	51	78
Land	48	67
Offshore	3	11
Colorado	16	62
Florida	2	10
Illinois	2	28
Indiana	2	5
Kansas	48	93
Kentucky	3	9
Louisiana	125	243
North	12	9
S. Inland Waters	20	39
S. Land	34	73
Offshore	59	122
Maryland	0	0
Michigan	21	36
Mississippi	8	30
Montana	9	16
Nebraska	2	7
New Mexico	26	80
New York	3	5
North Dakota	12	46

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	10-27-86	10-28-85
Ohio	21	31
Oklahoma	110	204
Pennsylvania	23	35
South Dakota	1	1
Texas	242	583
Offshore	14	38
Inland Waters	2	3
Dist. 1 & 4	42	74
Dist. 2 & 3	30	84
Dist. 5 & 6	40	72
Dist. 7B & 9	27	62
Dist. 7C,8 & 8A	66	222
Dist. 10	21	28
Utah	10	30
West Virginia	21	33
Wyoming	32	89
Others–Id.-1,Va.-8, Or.-1,Tn.-1	11	19
Total U.S.	**829**	**1,838**
Cum. Avg. to Date	**969**	**1,975**
Canada	126	284
Canada-Offshore	2	10
Grand Total	**957**	**2,132**

Rotary rigs from spudding in to total depth

Hughes rig count

	12-29-86	12-30-85
Alabama	6	23
Alaska	6	19
Arkansas	7	14
Arizona	0	0
California	52	84
Land	45	73
Offshore	7	11
Colorado	24	66
Florida	2	8
Illinois	3	25
Indiana	2	3
Kansas	51	54
Kentucky	1	4
Louisiana	128	279
North	7	23
S. Inland Waters	22	43
S. Land	37	82
Offshore	62	131
Maryland	0	0
Michigan	26	44
Mississippi	10	29
Montana	10	25
Nebraska	4	9
New Mexico	34	76
New York	4	5
North Dakota	10	43

Source: Hughes Tool Co.
Data available in Oil & Gas Journal Energy Database

	12-29-86	12-30-85
Ohio	26	21
Oklahoma	150	265
Pennsylvania	24	15
South Dakota	1	3
Texas	318	632
Offshore	22	32
Inland Waters	2	1
Dist. 1 & 4	50	73
Dist. 2 & 3	38	107
Dist. 5 & 6	35	65
Dist. 7B & 9	33	74
Dist. 7C,8 & 8A	117	245
Dist. 10	21	35
Utah	11	29
West Virginia	24	23
Wyoming	45	92
Others–NM.-1, NV.-1, VA.-7	9	8
Total U.S.	**988**	**1,898**
Cum. Avg. to Date	**963**	**1,968**
Canada	344	293
Canada-Offshore	1	5
Grand Total	**1,333**	**2,196**

Rotary rigs from spudding in to total depth

Smith rig count

Proposed depth (feet)	1-31-86		2-1-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	54	55.6	36	50.0
2,501- 5,000	319	87.8	435	86.9
5,001- 7,500	322	69.9	419	74.9
7,501-10,000	380	62.6	537	62.9
10,001-12,500	313	46.6	449	45.2
12,501-15,000	235	32.8	271	28.8
15,001-17,500	79	15.2	163	20.9
17,501-20,000	52	9.6	72	16.7
20,001-over	21	4.8	27	3.7
Total	**1,775**	**57.1**	**2,409**	**57.1**
INLAND	41		49	
LAND	1,543		2,110	
OFFSHORE	191		250	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	2-28-86		3-1-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	53	47.2	43	34.9
2,501- 5,000	215	83.7	364	88.2
5,001- 7,500	263	74.5	373	70.8
7,501-10,000	294	60.5	444	56.8
10,001-12,500	278	42.8	396	42.7
12,501-15,000	176	22.7	254	28.3
15,001-17,500	75	18.7	154	16.2
17,501-20,000	42	14.3	74	20.3
20,001-over	17	5.9	31	3.2
Total	**1,413**	**53.7**	**2,133**	**53.2**
INLAND	33		48	
LAND	1,214		1,844	
OFFSHORE	166		241	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	3-28-86		3-29-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	37	51.4	55	60.0
2,501- 5,000	188	84.6	393	87.0
5,001- 7,500	203	68.0	403	72.2
7,501-10,000	238	60.1	419	60.6
10,001-12,500	218	42.7	394	45.7
12,501-15,000	140	21.4	246	33.3
15,001-17,500	52	15.4	147	16.3
17,501-20,000	32	15.6	77	23.4
20,001-over	19	—	33	3.0
Total	**1,127**	**52.8**	**2,167**	**56.5**
INLAND	23		50	
LAND	973		1,888	
OFFSHORE	131		229	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	4-25-86		4-26-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	29	41.4	45	57.8
2,501- 5,000	155	80.0	398	85.7
5,001- 7,500	152	68.4	369	72.6
7,501-10,000	189	58.7	429	63.9
10,001-12,500	185	39.5	378	43.9
12,501-15,000	114	29.8	243	26.7
15,001-17,500	48	18.8	147	22.4
17,501-20,000	33	12.1	72	20.8
20,001-over	19	—	37	2.7
Total	**924**	**51.0**	**2,118**	**56.1**
INLAND	18		42	
LAND	785		1,863	
OFFSHORE	121		213	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	5-30-86		5-31-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	45	53.3	67	58.2
2,501- 5,000	141	87.9	401	84.0
5,001- 7,500	131	72.5	363	74.9
7,501-10,000	167	58.1	436	62.8
10,001-12,500	120	40.0	365	44.9
12,501-15,000	103	30.1	220	25.0
15,001-17,500	38	26.3	138	18.8
17,501-20,000	28	14.3	70	14.3
20,001-over	18	—	28	—
Total	**791**	**54.7**	**2,088**	**56.4**
INLAND	21		44	
LAND	674		1,833	
OFFSHORE	96		211	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	6-27-86		6-28-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	32	59.4	67	55.2
2,501- 5,000	148	89.9	396	84.4
5,001- 7,500	127	74.8	435	70.6
7,501-10,000	142	59.9	424	65.8
10,001-12,500	127	44.1	356	45.8
12,501-15,000	99	37.4	232	29.7
15,001-17,500	34	35.3	143	17.5
17,501-20,000	24	20.8	72	13.9
20,001-over	15	—	29	—
Total	**748**	**59.1**	**2,154**	**56.9**
INLAND	19		48	
LAND	651		1,900	
OFFSHORE	78		206	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	7-25-86		7-26-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	23	43.5	60	45.0
2,501- 5,000	162	84.0	394	86.0
5,001- 7,500	164	78.0	409	70.2
7,501-10,000	151	63.6	442	62.9
10,001-12,500	147	44.9	318	46.5
12,501-15,000	94	39.4	226	28.3
15,001-17,500	34	38.2	137	18.2
17,501-20,000	24	16.7	70	8.6
20,001-over	13	—	29	6.9
Total	**812**	**60.3**	**2,085**	**56.4**
INLAND	23		44	
LAND	715		1,849	
OFFSHORE	74		192	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	8-29-86		8-30-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	24	45.8	68	48.5
2,501- 5,000	146	86.3	406	89.9
5,001- 7,500	160	76.9	396	78.3
7,501-10,000	170	62.9	465	65.4
10,001-12,500	144	53.5	363	44.9
12,501-15,000	91	30.8	224	31.3
15,001-17,500	38	28.9	119	14.3
17,501-20,000	18	27.8	66	9.1
20,001-over	8	—	26	7.7
Total	**799**	**61.1**	**2,133**	**59.5**
INLAND	20		47	
LAND	707		1,890	
OFFSHORE	72		196	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	9-26-86		9-27-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	20	40.0	80	55.0
2,501- 5,000	174	88.5	409	85.8
5,001- 7,500	186	82.3	385	74.8
7,501-10,000	173	62.4	454	65.9
10,001-12,500	171	46.8	382	44.0
12,501-15,000	90	32.2	215	32.6
15,001-17,500	39	30.8	121	18.2
17,501-20,000	18	27.8	62	12.9
20,001-over	7	—	24	4.2
Total	**878**	**62.5**	**2,132**	**58.7**
INLAND	22		44	
LAND	784		1,879	
OFFSHORE	72		209	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	10-24-86		10-25-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	32	40.6	70	51.4
2,501- 5,000	216	91.2	404	88.4
5,001- 7,500	177	81.9	378	77.0
7,501-10,000	190	62.1	441	62.8
10,001-12,500	171	47.4	371	42.0
12,501-15,000	89	46.1	206	29.1
15,001-17,500	37	37.8	111	18.9
17,501-20,000	15	33.3	68	8.8
20,001-over	5	—	23	8.7
Total	**932**	**65.9**	**2,072**	**58.2**
INLAND	20		47	
LAND	841		1,815	
OFFSHORE	71		210	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	11-28-86		11-29-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	29	27.6	72	45.8
2,501- 5,000	199	87.9	366	86.1
5,001- 7,500	220	76.8	422	72.3
7,501-10,000	234	70.9	477	63.7
10,001-12,500	193	47.7	335	46.6
12,501-15,000	100	38.0	233	27.5
15,001-17,500	53	37.7	116	17.2
17,501-20,000	17	35.3	64	10.9
20,001-over	8	12.5	21	9.5
Total	**1,053**	**64.1**	**2,106**	**57.3**
INLAND	22		51	
LAND	939		1,845	
OFFSHORE	92		210	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

Smith rig count

Proposed depth (feet)	12-19-86		12-20-85	
	Rig count	% footage*	Rig count	% footage*
0- 2,500	36	33.3	80	45.0
2,501- 5,000	225	88.0	468	87.6
5,001- 7,500	236	79.2	447	76.5
7,501-10,000	231	68.0	487	66.9
10,001-12,500	194	50.0	372	48.4
12,501-15,000	98	39.8	237	32.5
15,001-17,500	59	25.4	107	15.0
17,501-20,000	19	26.3	62	8.1
20,001-over	8	25.0	18	5.6
Total	**1,106**	**64.4**	**2,278**	**61.1**
INLAND	23		49	
LAND	995		2,015	
OFFSHORE	88		214	

* Rigs employed under footage contracts.
Definitions, see OGJ 3/19/84, p. 138.
Source: Smith International Inc.
Data available in Oil & Gas Journal Energy Database.

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	1-31-86*	2-1-85†
Alabama	57	57
Alaska	1,824	1,705
California	1,160	1,139
Colorado	77	78
Florida	28	34
Illinois	85	79
Kansas	202	197
Louisiana	1,418	1,425
Michigan	84	78
Mississippi	84	84
Montana	83	80
New Mexico	210	217
North Dakota	139	142
Oklahoma	420	440
Texas	2,405	2,399
Utah	105	59
Wyoming	335	334
Other States	187	182
Total	**8,903**	**8,729**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	2-28-86*	3-1-85†
Alabama	57	58
Alaska	1,825	1,875
California	1,159	1,154
Colorado	77	78
Florida	28	34
Illinois	84	72
Kansas	203	201
Louisiana	1,412	1,399
Michigan	84	78
Mississippi	84	85
Montana	83	81
New Mexico	210	216
North Dakota	139	141
Oklahoma	419	426
Texas	2,398	2,396
Utah	106	85
Wyoming	335	334
Other States	188	187
Total	**8,891**	**8,900**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	3-28-86*	3-29-85†
Alabama	55	60
Alaska	1,830	1,865
California	1,148	1,144
Colorado	76	78
Florida	27	33
Illinois	81	78
Kansas	199	204
Louisiana	1,410	1,422
Michigan	82	78
Mississippi	84	84
Montana	83	83
New Mexico	210	219
North Dakota	137	143
Oklahoma	408	440
Texas	2,388	2,451
Utah	104	108
Wyoming	335	334
All others	186	197
Total	**8,843**	**9,021**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	4-25-86*	4-26-85†
Alabama	56	59
Alaska	1,860	1,784
California	1,150	1,148
Colorado	75	78
Florida	30	33
Illinois	80	86
Kansas	195	219
Louisiana	1,420	1,422
Michigan	81	77
Mississippi	83	83
Montana	78	81
New Mexico	216	218
North Dakota	133	142
Oklahoma	405	451
Texas	2,383	2,443
Utah	97	106
Wyoming	335	334
All others	185	193
Total	**8,862**	**8,957**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	5-30-86*	5-31-85†
Alabama	56	61
Alaska	1,861	1,888
California	1,149	1,081
Colorado	75	78
Florida	28	32
Illinois	80	83
Kansas	196	214
Louisiana	1,425	1,425
Michigan	80	77
Mississippi	83	82
Montana	78	81
New Mexico	216	214
North Dakota	134	143
Oklahoma	405	450
Texas	2,381	2,447
Utah	100	88
Wyoming	334	334
Other States	185	192
Total	**8,866**	**8,970**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	6-27-86*	6-28-85†
Alabama	57	58
Alaska	1,875	1,871
California	1,133	1,162
Colorado	77	78
Florida	28	32
Illinois	81	81
Kansas	198	201
Louisiana	1,320	1,425
Michigan	76	78
Mississippi	82	85
Montana	80	81
New Mexico	210	212
North Dakota	133	142
Oklahoma	408	420
Texas	2,379	2,409
Utah	102	116
Wyoming	334	334
All others	184	192
Total	**8,757**	**8,977**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	7-25-86*	7-26-85†
Alabama	57	60
Alaska	1,885	1,821
California	1,130	1,153
Colorado	80	80
Florida	29	30
Illinois	80	86
Kansas	198	201
Louisiana	1,316	1,421
Michigan	75	76
Mississippi	84	85
Montana	81	81
New Mexico	209	212
North Dakota	132	140
Oklahoma	409	438
Texas	2,375	2,420
Utah	100	114
Wyoming	334	351
All others	185	194
Total	**8,759**	**8,963**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	8-29-86*	8-30-85†
Alabama	56	58
Alaska	1,880	1,795
California	1,132	1,158
Colorado	80	82
Florida	29	29
Illinois	81	86
Kansas	185	210
Louisiana	1,313	1,270
Michigan	76	77
Mississippi	84	84
Montana	77	83
New Mexico	208	213
North Dakota	130	140
Oklahoma	405	449
Texas	2,335	2,407
Utah	100	115
Wyoming	335	354
Other States	184	193
Total	**8,690**	**8,803**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	9-26-86*	9-27-85†
Alabama	56	59
Alaska	1,860	1,867
California	1,137	1,167
Colorado	80	82
Florida	29	30
Illinois	81	85
Kansas	183	208
Louisiana	1,320	1,356
Michigan	76	76
Mississippi	84	84
Montana	77	83
New Mexico	206	212
North Dakota	130	139
Oklahoma	398	429
Texas	2,327	2,408
Utah	98	119
Wyoming	334	358
All others	184	192
Total	**8,660**	**8,954**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	10-24-86*	10-25-85†
Alabama	56	59
Alaska	1,865	1,853
California	1,142	1,177
Colorado	80	82
Florida	26	31
Illinois	79	87
Kansas	183	216
Louisiana	1,400	1,330
Michigan	75	75
Mississippi	81	84
Montana	74	82
New Mexico	203	211
North Dakota	123	139
Oklahoma	395	454
Texas	2,250	2,420
Utah	107	117
Wyoming	342	356
All others	184	193
Total	**8,665**	**8,966**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	11-28-86*	11-29-85†
Alabama	56	56
Alaska	1,920	1,804
California	1,155	1,185
Colorado	80	82
Florida	21	29
Illinois	78	86
Kansas	181	198
Louisiana	1,398	1,348
Michigan	74	75
Mississippi	80	84
Montana	73	80
New Mexico	201	212
North Dakota	121	137
Oklahoma	360	439
Texas	2,130	2,442
Utah	110	116
Wyoming	342	343
Other States	184	186
Total	**8,564**	**8,902**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

OGJ production report

Crude oil and lease condensate
(1,000 b/d)

	12-26-86*	12-27-85†
Alabama	56	62
Alaska	1,960	1,842
California	1,085	1,186
Colorado	76	82
Florida	20	30
Illinois	78	83
Kansas	170	207
Louisiana	1,371	1,408
Michigan	70	71
Mississippi	79	83
Montana	72	78
New Mexico	201	215
North Dakota	115	131
Oklahoma	359	450
Texas	2,180	2,436
Utah	103	116
Wyoming	308	333
All others	183	190
Total	**8,486**	**9,003**

*OGJ estimate †Revised

Source: Oil & Gas Journal
Data available in Oil & Gas Journal Energy Database

API refinery report—January 31, 1986

District	Refinery operations (Thousands of barrels daily)					Refinery output (Thousands of barrels daily)						
						Motor gasoline			Jet fuel		Fuel oils	
	Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Total	Leaded*	Unleaded*	Naphtha	Kero	Distillate	Residual
East coast	1,239	1,023	1,026	1,487	69.0	636	151	485	20	65	306	144
App. Dist. 1	96	91	92	116	79.3	38	14	24	—	—	30	4
Dist. 1 total	**1,335**	**1,114**	**1,118**	**1,603**	**69.7**	**674**	**165**	**509**	**20**	**65**	**336**	**148**
App. Dist. 2	66	59	59	66	89.4	38	13	25	—	1	17	2
Ind., Ill., Ky.	2,048	1,773	1,803	2,176	82.9	1,136	318	818	19	116	347	53
Minn., Wis., Dak.	309	293	293	301	97.3	160	52	108	3	12	74	5
Okla., Kan., Mo.	709	631	635	726	87.5	420	213	207	2	45	159	11
Dist. 2 total	**3,132**	**2,756**	**2,790**	**3,269**	**85.3**	**1,754**	**596**	**1,158**	**24**	**174**	**597**	**71**
Inland Texas	559	453	455	547	83.2	287	120	167	24	27	114	19
Texas Gulf coast	3,325	2,886	2,993	3,736	80.1	1,574	428	1,146	36	285	612	143
La. Gulf Coast	2,414	2,164	2,164	2,608	83.0	1,058	256	802	23	299	472	120
N. La. and Ark.	194	182	183	250	73.2	56	19	37	7	—	56	9
New Mexico	81	63	65	68	95.6	36	17	19	10	1	13	—
Dist. 3 total	**6,573**	**5,748**	**5,860**	**7,209**	**81.3**	**3,011**	**840**	**2,171**	**100**	**612**	**1,267**	**296**
Dist. 4 total	**418**	**409**	**412**	**559**	**73.7**	**219**	**110**	**109**	**13**	**22**	**110**	**9**
Dist. 5 total	**2,485**	**2,370**	**2,403**	**3,034**	**79.2**	**1,061**	**291**	**770**	**57**	**281**	**412**	**358**
January 31, 1986	**13,943**	**12,397**	**12,583**	**15,674**	**80.3**	**6,719**	**2,002**	**4,717**	**214**	**1,154**	**2,722**	**882**
January 24, 1986†	**13,973**	**12,408**	**12,575**	**15,674**	**80.2**	**6,429**	**2,028**	**4,401**	**202**	**1,192**	**2,886**	**1,024**
February 1, 1985	**12,303**	**11,430**	**11,586**	**15,746**	**73.6**	**5,821**	**2,101**	**3,720**	**209**	**934**	**2,693**	**1,061**

*Included in total motor gasoline †Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API refinery report—February 28, 1986

District	Refinery operations (Thousands of barrels daily)					Refinery output (Thousands of barrels daily)						
						Motor gasoline			Jet fuel		Fuel oils	
	Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Total	Leaded*	Unleaded*	Naphtha	Kero	Distillate	Residual
East coast	1,218	975	988	1,487	66.4	599	139	460	18	34	273	138
App. Dist. 1	101	97	97	116	83.6	39	10	29	—	—	29	4
Dist. 1 total	**1,319**	**1,072**	**1,085**	**1,603**	**67.7**	**638**	**149**	**489**	**18**	**34**	**302**	**142**
App. Dist. 2	67	60	60	66	90.9	41	17	24	—	—	16	2
Ind., Ill., Ky.	1,844	1,660	1,672	2,176	76.8	1,044	316	728	15	134	326	58
Minn., Wis., Dak.	304	290	290	301	96.3	165	57	108	3	16	75	6
Okla., Kan., Mo.	660	571	575	726	79.2	349	152	197	1	66	130	11
Dist. 2 total	**2,875**	**2,581**	**2,597**	**3,269**	**79.4**	**1,599**	**542**	**1,057**	**19**	**216**	**547**	**77**
Inland Texas	627	475	478	547	87.4	300	115	185	34	33	104	17
Texas Gulf Coast	3,336	2,861	2,953	3,736	79.0	1,613	467	1,146	50	315	607	133
La. Gulf Coast	2,169	2,120	2,127	2,608	81.6	1,072	277	795	25	262	439	58
N. La. and Ark.	200	187	189	250	75.6	58	22	36	10	—	56	13
New Mexico	68	59	61	68	89.7	35	17	18	8	1	13	—
Dist. 3 total	**6,400**	**5,702**	**5,808**	**7,209**	**80.6**	**3,078**	**898**	**2,180**	**127**	**611**	**1,219**	**221**
Dist. 4 total	**388**	**381**	**384**	**559**	**68.7**	**195**	**85**	**110**	**15**	**33**	**103**	**6**
Dist. 5 total	**2,488**	**2,329**	**2,347**	**3,034**	**77.4**	**1,082**	**319**	**763**	**26**	**277**	**423**	**353**
February 28, 1986	**13,470**	**12,065**	**12,221**	**15,674**	**78.0**	**6,592**	**1,993**	**4,599**	**205**	**1,171**	**2,594**	**799**
February 21, 1986†	**13,553**	**12,160**	**12,343**	**15,674**	**78.7**	**6,499**	**1,942**	**4,557**	**197**	**1,171**	**2,726**	**963**
March 1, 1985	**12,448**	**11,430**	**11,574**	**15,621**	**74.1**	**5,895**	**2,243**	**3,652**	**192**	**1,013**	**2,416**	**1,069**

*Included in total motor gasoline †Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API refinery report—March 28, 1986

District	Refinery operations (Thousands of barrels daily)					Refinery output (Thousands of barrels daily)						
						Motor gasoline			Jet fuel		Fuel oils	
	Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Total	Leaded*	Unleaded*	Naphtha	Kero	Distillate	Residual
East coast	1,205	981	994	1,487	66.8	558	137	421	17	48	357	110
App. Dist. 1	103	100	100	116	86.2	42	12	30	—	—	33	6
Dist. 1 total	**1,308**	**1,081**	**1,094**	**1,603**	**68.2**	**600**	**149**	**451**	**17**	**48**	**390**	**116**
App. Dist. 2	63	55	55	66	83.3	33	10	23	—	—	16	5
Ind., Ill., Ky.	1,934	1,749	1,772	2,176	81.4	1,097	286	811	18	103	390	58
Minn., Wis., Dak.	304	283	283	301	94.0	170	50	120	5	10	82	5
Okla., Kan., Mo.	678	599	603	726	83.1	355	182	173	2	28	176	11
Dist. 2 total	**2,979**	**2,686**	**2,713**	**3,269**	**83.0**	**1,655**	**528**	**1,127**	**25**	**141**	**664**	**79**
Inland Texas	585	442	442	547	80.8	260	97	163	29	32	117	26
Texas Gulf coast	3,360	2,833	3,023	3,736	80.9	1,231	415	816	40	345	657	170
La. Gulf Coast	2,060	1,776	1,786	2,608	68.5	1,053	300	753	14	234	494	80
N. La. and Ark.	102	94	97	250	38.8	25	13	12	2	—	30	6
New Mexico	38	35	35	68	51.5	20	10	10	1	3	8	—
Dist. 3 total	**6,145**	**5,180**	**5,383**	**7,209**	**74.7**	**2,589**	**835**	**1,754**	**86**	**614**	**1,306**	**282**
Dist. 4 total	**426**	**418**	**421**	**559**	**75.3**	**225**	**118**	**107**	**13**	**24**	**108**	**13**
Dist. 5 total	**2,449**	**2,374**	**2,383**	**3,034**	**78.5**	**990**	**307**	**683**	**61**	**251**	**393**	**323**
March 28, 1986	**13,307**	**11,739**	**11,994**	**15,674**	**76.5**	**6,059**	**1,937**	**4,122**	**202**	**1,078**	**2,861**	**813**
March 21, 1986†	**13,101**	**11,507**	**11,764**	**15,674**	**75.1**	**5,961**	**1,824**	**4,137**	**186**	**1,112**	**2,727**	**799**
March 29, 1985	**12,487**	**11,467**	**11,605**	**15,621**	**74.3**	**6,216**	**2,330**	**3,886**	**237**	**935**	**2,359**	**1,083**

*Included in total motor gasoline †Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API refinery report—April 25, 1986

	Refinery operations (Thousands of barrels daily)					Refinery output (Thousands of barrels daily)						
						Motor gasoline			Jet fuel		Fuel oils	
District	Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Total	Leaded*	Unleaded*	Naphtha	Kero	Distillate	Residual
East coast	1,217	956	966	1,336	72.3	625	110	515	18	38	273	108
App. Dist. 1	108	103	103	109	94.5	46	15	31	—	—	34	5
Dist. 1 total	**1,325**	**1,059**	**1,069**	**1,445**	**74.0**	**671**	**125**	**546**	**18**	**38**	**307**	**113**
App. Dist. 2	73	64	64	66	97.0	43	15	28	—	1	13	3
Ind., Ill., Ky.	1,881	1,725	1,739	2,207	78.8	1,004	255	749	11	125	375	46
Minn., Wis., Dak.	310	293	293	317	92.4	163	22	141	3	15	76	6
Okla., Kan., Mo.	655	600	601	726	82.8	325	182	143	2	23	178	9
Dist. 2 total	**2,919**	**2,682**	**2,697**	**3,316**	**81.3**	**1,535**	**474**	**1,061**	**16**	**164**	**642**	**64**
Inland Texas	619	476	484	551	87.8	300	120	180	37	32	105	24
Texas Gulf Coast	3,586	3,079	3,269	3,690	88.6	1,600	551	1,049	36	270	641	153
La. Gulf Coast	2,393	2,177	2,184	2,607	83.8	1,157	261	896	26	256	452	121
N. La. and Ark.	166	155	157	248	63.3	44	13	31	3	—	39	8
New Mexico	63	59	61	68	89.7	37	17	20	11	6	14	—
Dist. 3 total	**6,827**	**5,946**	**6,155**	**7,164**	**85.9**	**3,138**	**962**	**2,176**	**113**	**564**	**1,251**	**306**
Dist. 4 total	**467**	**453**	**456**	**552**	**82.6**	**235**	**108**	**127**	**12**	**31**	**124**	**12**
Dist. 5 total	**2,436**	**2,398**	**2,398**	**3,034**	**79.0**	**1,061**	**347**	**714**	**54**	**223**	**408**	**365**
April 25, 1986	**13,974**	**12,538**	**12,775**	**15,511**	**82.4**	**6,640**	**2,016**	**4,624**	**213**	**1,020**	**2,732**	**860**
April 18, 1986†	**13,869**	**12,641**	**12,883**	**15,511**	**83.1**	**6,541**	**1,992**	**4,549**	**219**	**944**	**2,819**	**920**
April 26, 1985	**12,903**	**11,692**	**11,898**	**15,514**	**76.7**	**6,502**	**2,337**	**4,165**	**234**	**901**	**2,442**	**1,008**

*Included in total motor gasoline. †Revised

Source: American Petroleum Institute

Data available in Oil & Gas Journal Energy Database

API refinery report—May 30, 1986

	Refinery operations (Thousands of barrels daily)					Refinery output (Thousands of barrels daily)						
						Motor gasoline			Jet fuel		Fuel oils	
District	Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Total	Leaded*	Unleaded*	Naphtha	Kero	Distillate	Residual
East coast	1,432	1,240	1,252	1,336	93.7	741	197	544	17	48	232	115
App. Dist. 1	119	113	115	109	105.5	39	16	23	—	—	34	5
Dist. 1 total	**1,551**	**1,353**	**1,367**	**1,445**	**94.6**	**780**	**213**	**567**	**17**	**48**	**266**	**120**
App. Dist. 2	76	68	71	66	107.6	40	15	25	—	—	15	3
Ind., Ill., Ky.	2,190	1,921	1,927	2,207	87.3	1,172	387	785	23	107	414	47
Minn., Wis., Dak.	323	309	309	317	97.5	152	50	102	9	9	74	7
Okla., Kan., Mo.	697	682	683	726	94.1	397	191	206	1	30	198	9
Dist. 2 total	**3,286**	**2,980**	**2,990**	**3,316**	**90.2**	**1,761**	**643**	**1,118**	**33**	**146**	**701**	**66**
Inland Texas	609	471	488	551	88.6	315	128	187	29	29	127	20
Texas Gulf Coast	3,634	3,234	3,362	3,690	91.1	1,726	592	1,134	33	255	616	166
La. Gulf Coast	2,559	2,322	2,342	2,607	89.8	1,299	338	961	6	239	507	96
N. La. and Ark.	186	170	172	248	69.4	60	13	47	7	4	55	8
New Mexico	71	59	61	68	89.7	34	14	20	10	2	15	—
Dist. 3 total	**7,059**	**6,256**	**6,425**	**7,164**	**89.7**	**3,434**	**1,085**	**2,349**	**85**	**529**	**1,320**	**290**
Dist. 4 total	**493**	**475**	**479**	**552**	**86.8**	**250**	**110**	**140**	**14**	**23**	**132**	**10**
Dist. 5 total	**2,533**	**2,435**	**2,443**	**3,034**	**80.5**	**1,084**	**371**	**713**	**59**	**280**	**454**	**367**
May 30, 1986	**14,922**	**13,499**	**13,704**	**15,511**	**88.4**	**7,309**	**2,422**	**4,887**	**208**	**1,026**	**2,873**	**853**
May 23, 1986†	**14,734**	**13,344**	**13,492**	**15,511**	**87.0**	**7,036**	**2,369**	**4,667**	**148**	**1,066**	**2,890**	**953**
May 31, 1985	**13,440**	**12,202**	**12,377**	**15,514**	**79.8**	**6,466**	**2,419**	**4,047**	**195**	**868**	**2,708**	**783**

*Included in total motor gasoline. †Revised

Source: American Petroleum Institute

Data available in Oil & Gas Journal Energy Database

API refinery report—June 27, 1986

	Refinery operations (Thousands of barrels daily)					Refinery output (Thousands of barrels daily)						
						Motor gasoline			Jet fuel		Fuel oils	
District	Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Total	Leaded*	Unleaded*	Naphtha	Kero	Distillate	Residual
East coast	1,522	1,295	1,302	1,336	97.5	758	146	612	29	56	277	129
App. Dist. 1	118	111	111	109	101.8	42	12	30	—	—	40	6
Dist. 1 total	**1,640**	**1,406**	**1,413**	**1,445**	**97.8**	**800**	**158**	**642**	**29**	**56**	**317**	**135**
App. Dist. 2	69	63	63	66	95.5	36	13	23	—	—	14	2
Ind., Ill., Ky.	2,095	1,943	1,945	2,207	88.1	1,095	344	751	4	101	384	41
Minn., Wis., Dak.	324	309	309	317	97.5	159	41	118	4	11	73	9
Okla., Kan., Mo.	687	668	669	726	92.1	373	181	192	3	32	188	10
Dist. 2 total	**3,175**	**2,983**	**2,986**	**3,316**	**90.0**	**1,663**	**579**	**1,084**	**11**	**144**	**659**	**62**
Inland Texas	578	498	498	551	90.4	299	108	191	25	32	114	25
Texas Gulf Coast	3,530	3,101	3,245	3,690	87.9	1,744	545	1,199	28	295	610	172
La. Gulf Coast	2,374	2,245	2,245	2,607	86.1	1,083	250	833	6	270	399	129
N. La. and Ark.	189	182	184	248	74.2	62	15	47	5	—	53	7
New Mexico	80	62	65	68	95.6	38	18	20	9	3	15	—
Dist. 3 total	**6,751**	**6,088**	**6,237**	**7,164**	**87.1**	**3,226**	**936**	**2,290**	**73**	**600**	**1,191**	**333**
Dist. 4 total	**523**	**482**	**498**	**552**	**90.2**	**240**	**95**	**145**	**10**	**29**	**119**	**11**
Dist. 5 total	**2,562**	**2,461**	**2,461**	**3,034**	**81.1**	**1,144**	**322**	**822**	**66**	**294**	**398**	**380**
June 27, 1986	**14,651**	**13,420**	**13,595**	**15,511**	**87.6**	**7,073**	**2,090**	**4,983**	**189**	**1,123**	**2,684**	**921**
June 20, 1986†	**14,499**	**13,278**	**13,515**	**15,511**	**87.1**	**7,165**	**2,294**	**4,871**	**227**	**1,146**	**2,738**	**924**
June 28, 1985	**13,581**	**12,440**	**12,567**	**15,514**	**81.0**	**6,940**	**2,668**	**4,272**	**219**	**986**	**2,488**	**690**

*Included in total motor gasoline. †Revised

Source: American Petroleum Institute

Data available in Oil & Gas Journal Energy Database

API refinery report—July 25, 1986

District	Refinery operations (Thousands of barrels daily)					Refinery outout (Thousands of barrels daily)						
						Motor gasoline			Jet fuel		Fuel oils	
	Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Total	Leaded*	Unleaded*	Naphtha	Kero	Distillate	Residual
East coast	1,401	1,213	1,213	1,346	90.1	670	134	536	47	51	314	115
App. Dist. 1	103	94	95	108	88.0	34	11	23	—	—	32	3
Dist. 1 total	**1,504**	**1,307**	**1,308**	**1,454**	**90.0**	**704**	**145**	**559**	**47**	**51**	**346**	**118**
App. Dist. 2	54	48	48	66	72.7	28	8	20	—	—	15	1
Ind., Ill., Ky	2,094	1,977	1,977	2,210	89.5	1,123	334	789	20	122	364	62
Minn., Wis., Dak.	329	313	313	322	97.2	189	67	122	5	13	77	9
Okla., Kan., Mo.	633	610	610	726	84.0	381	182	199	—	23	170	7
Dist. 2 total	**3,110**	**2,948**	**2,948**	**3,324**	**88.7**	**1,721**	**591**	**1,130**	**25**	**158**	**626**	**79**
Inland Texas	547	473	473	568	83.3	298	119	179	20	35	117	24
Texas Gulf Coast	3,411	3,025	3,071	3,745	82.0	1,590	463	1,127	33	307	630	156
La. Gulf Coast	2,139	2,024	2,033	2,578	78.9	1,074	222	852	7	257	431	113
N. La. and Ark.	183	175	175	258	67.8	61	21	40	4	—	58	7
New Mexico	86	65	66	79	83.5	41	18	23	9	2	17	—
Dist. 3 total	**6,366**	**5,762**	**5,818**	**7,228**	**80.5**	**3,064**	**843**	**2,221**	**73**	**601**	**1,253**	**300**
Dist. 4 total	**488**	**471**	**471**	**527**	**89.4**	**267**	**117**	**150**	**12**	**32**	**114**	**10**
Dist. 5 total	**2,521**	**2,465**	**2,466**	**3,069**	**80.4**	**1,248**	**369**	**879**	**62**	**270**	**449**	**354**
July 25, 1986	**13,989**	**12,953**	**13,011**	**15,602**	**83.4**	**7,004**	**2,065**	**4,939**	**219**	**1,112**	**2,788**	**861**
July 18, 1986†	**14,114**	**13,002**	**13,171**	**15,602**	**84.4**	**7,058**	**2,151**	**4,907**	**200**	**1,114**	**2,616**	**763**
July 26, 1985	**13,631**	**12,452**	**12,686**	**15,619**	**81.2**	**6,861**	**2,465**	**4,396**	**213**	**944**	**2,653**	**793**

*Included in total motor gasoline †Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API refinery report—August 29, 1986

District	Refinery operations (Thousands of barrels daily)					Refinery output (Thousands of barrels daily)						
						Motor gasoline			Jet fuel		Fuel oils	
	Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Total	Leaded*	Unleaded*	Naphtha	Kero	Distillate	Residual
East coast	1,374	1,192	1,203	1,346	89.4	692	200	492	26	66	335	168
App. Dist. 1	109	100	101	108	93.5	35	15	20	—	—	33	3
Dist. 1 total	**1,483**	**1,292**	**1,304**	**1,454**	**89.7**	**727**	**215**	**512**	**26**	**66**	**368**	**171**
App. Dist. 2	65	60	60	66	90.9	38	9	29	—	1	15	1
Ind., Ill., Ky	2,207	1,958	2,033	2,210	92.0	1,180	311	869	17	135	407	75
Minn., Wis., Dak.	328	316	317	322	98.4	164	96	68	—	16	77	8
Okla., Kan., Mo.	695	652	654	726	90.1	374	153	221	—	37	191	6
Dist. 2 total	**3,295**	**2,986**	**3,064**	**3,324**	**92.2**	**1,756**	**569**	**1,187**	**17**	**189**	**690**	**90**
Inland Texas	572	485	493	568	86.8	316	137	179	22	27	120	17
Texas Gulf Coast	3,574	3,138	3,160	3,745	84.4	1,658	534	1,124	27	269	711	195
La. Gulf Coast	2,351	2,186	2,191	2,578	85.0	1,235	325	910	5	179	460	114
N. La. and Ark.	197	188	195	258	75.6	59	10	49	4	—	55	9
New Mexico	88	72	72	79	91.1	38	17	21	12	1	16	—
Dist. 3 total	**6,782**	**6,069**	**6,111**	**7,228**	**84.5**	**3,306**	**1,023**	**2,283**	**70**	**476**	**1,362**	**335**
Dist. 4 total	**507**	**485**	**487**	**527**	**92.4**	**263**	**136**	**127**	**10**	**29**	**121**	**8**
Dist. 5 total	**2,643**	**2,484**	**2,505**	**3,069**	**81.6**	**1,119**	**361**	**758**	**33**	**306**	**423**	**363**
August 29, 1986	**14,710**	**13,316**	**13,471**	**15,602**	**86.3**	**7,171**	**2,304**	**4,867**	**156**	**1,066**	**2,964**	**967**
August 22, 1986†	**14,604**	**13,330**	**13,477**	**15,602**	**86.4**	**7,152**	**2,214**	**4,938**	**200**	**1,043**	**2,931**	**935**
August 30, 1985	**13,771**	**12,116**	**12,291**	**15,619**	**78.7**	**6,882**	**2,400**	**4,482**	**213**	**1,028**	**2,511**	**687**

*Included in total motor gasoline †Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API refinery report—September 26, 1986

District	Refinery operations (Thousands of barrels daily)					Refinery output (Thousands of barrels daily)						
						Motor gasoline			Jet fuel		Fuel oils	
	Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Total	Leaded*	Unleaded*	Naphtha	Kero	Distillate	Residual
East coast	1,412	1,228	1,229	1,346	91.3	734	192	542	14	54	259	119
App. Dist. 1	93	82	82	108	75.9	34	11	23	—	—	28	4
Dist. 1 total	**1,505**	**1,310**	**1,311**	**1,454**	**90.2**	**768**	**203**	**565**	**14**	**54**	**287**	**123**
App. Dist. 2	62	55	55	66	83.3	35	13	22	—	—	14	2
Ind., Ill., Ky.	2,023	1,819	1,831	2,210	82.9	1,024	288	736	13	133	387	67
Minn., Wis., Dak.	280	269	269	322	83.5	130	51	79	4	11	63	9
Okla., Kan., Mo.	634	571	577	726	79.5	381	177	204	—	43	157	3
Dist. 2 total	**2,999**	**2,714**	**2,732**	**3,324**	**82.2**	**1,570**	**529**	**1,041**	**17**	**187**	**621**	**81**
Inland Texas	592	516	517	568	91.0	317	119	198	24	45	138	19
Texas Gulf Coast	3,417	3,062	3,079	3,745	82.2	1,561	391	1,170	69	276	651	128
La. Gulf Coast	2,395	2,224	2,241	2,578	86.9	1,142	300	842	12	237	521	150
N. La. and Ark.	172	161	163	258	63.2	53	8	45	1	—	50	4
New Mexico	86	68	68	79	86.1	42	18	24	8	1	17	—
Dist. 3 total	**6,662**	**6,031**	**6,066**	**7,228**	**84.0**	**3,115**	**836**	**2,279**	**114**	**559**	**1,377**	**301**
Dist. 4 total	**455**	**433**	**436**	**527**	**82.7**	**228**	**90**	**138**	**14**	**16**	**117**	**10**
Dist. 5 total	**2,614**	**2,458**	**2,488**	**3,069**	**81.1**	**1,133**	**366**	**767**	**34**	**287**	**426**	**363**
September 26, 1986	**14,235**	**12,946**	**13,035**	**15,602**	**83.5**	**6,814**	**2,024**	**4,790**	**193**	**1,103**	**2,828**	**878**
September 19, 1986†	**14,258**	**13,294**	**13,402**	**15,602**	**85.9**	**6,870**	**2,050**	**4,820**	**184**	**1,124**	**2,903**	**875**
September 27, 1985	**13,306**	**12,207**	**12,337**	**15,619**	**79.0**	**6,463**	**2,172**	**4,291**	**183**	**998**	**2,703**	**799**

*Included in total motor gasoline †Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API refinery report—October 24, 1986

District	Refinery operations (Thousands of barrels daily) Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Refinery output (Thousands of barrels daily) Motor gasoline Total	Leaded*	Unleaded*	Jet fuel Naphtha	Kero	Fuel oils Distillate	Residual
East coast	1,421	1,188	1,196	1,346	88.9	664	153	511	22	58	261	121
App. Dist. 1	112	100	101	108	93.5	35	14	21	—	—	33	4
Dist. 1 total	**1,533**	**1,288**	**1,297**	**1,454**	**89.2**	**699**	**167**	**532**	**22**	**58**	**294**	**125**
App. Dist. 2	13	5	6	66	9.1	8	8	—	—	—	3	1
Ind., Ill., Ky.	1,873	1,883	1,883	2,210	85.2	1,070	275	795	15	118	342	56
Minn., Wis., Dak.	315	303	303	322	94.1	144	35	109	5	17	75	7
Okla., Kan., Mo.	715	668	680	726	93.7	349	136	213	—	46	186	3
Dist. 2 total	**2,916**	**2,859**	**2,872**	**3,324**	**86.4**	**1,571**	**454**	**1,117**	**20**	**181**	**606**	**67**
Inland Texas	491	422	438	568	77.1	260	108	152	31	21	97	19
Texas Gulf coast	3,423	2,921	2,982	3,738	79.8	1,423	395	1,028	41	304	679	113
La. Gulf Coast	2,241	2,096	2,139	2,578	83.0	1,034	277	757	11	286	413	132
N. La. and Ark.	204	185	189	258	73.3	54	6	48	6	—	54	6
New Mexico	80	68	68	79	86.1	44	17	27	9	2	15	—
Dist. 3 total	**6,439**	**5,692**	**5,816**	**7,221**	**80.5**	**2,815**	**803**	**2,012**	**98**	**613**	**1,258**	**270**
Dist. 4 total	**461**	**437**	**441**	**527**	**83.7**	**219**	**106**	**113**	**17**	**21**	**108**	**10**
Dist. 5 total	**2,629**	**2,455**	**2,484**	**3,068**	**81.0**	**1,181**	**380**	**801**	**54**	**317**	**425**	**341**
October 24, 1986	**13,978**	**12,731**	**12,910**	**15,594**	**82.8**	**6,485**	**1,910**	**4,575**	**211**	**1,190**	**2,691**	**813**
October 17, 1986†	**13,997**	**12,637**	**12,804**	**15,594**	**82.1**	**6,903**	**1,999**	**4,904**	**193**	**1,099**	**2,668**	**774**
October 25, 1985	**13,618**	**12,494**	**12,611**	**15,638**	**80.6**	**6,569**	**2,395**	**4,174**	**165**	**1,026**	**3,008**	**897**

*Included in total motor gasoline. †Revised.
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API refinery report—November 28, 1986

District	Refinery operations (Thousands of barrels daily) Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Refinery output (Thousands of barrels daily) Motor gasoline Total	Leaded*	Unleaded*	Jet fuel Naphtha	Kero	Fuel oils Distillate	Residual
East coast	1,279	1,052	1,062	1,346	78.9	668	148	520	21	48	277	101
App. Dist. 1	115	106	107	108	99.1	40	8	32	—	—	36	7
Dist. 1 total	**1,394**	**1,158**	**1,169**	**1,454**	**80.4**	**708**	**156**	**552**	**21**	**48**	**313**	**108**
App. Dist. 2	70	66	66	66	100.0	33	12	21	—	—	17	3
Ind., Ill., Ky.	2,070	1,898	1,925	2,210	87.1	1,161	296	865	10	127	463	73
Minn., Wis., Dak.	315	302	302	322	93.8	143	28	115	4	12	74	6
Okla., Kan., Mo.	695	659	669	726	92.1	387	138	249	7	40	202	8
Dist. 2 total	**3,150**	**2,925**	**2,962**	**3,324**	**89.1**	**1,724**	**474**	**1,250**	**21**	**179**	**756**	**90**
Inland Texas	537	471	484	568	85.2	322	120	202	34	25	114	20
Texas Gulf coast	3,473	2,983	3,025	3,738	80.9	1,595	422	1,173	61	254	753	154
La. Gulf Coast	2,471	2,284	2,314	2,578	89.8	1,172	319	853	13	289	564	159
N. La. and Ark.	191	180	184	258	71.3	51	23	28	5	—	50	8
New Mexico	72	68	68	79	86.1	38	17	21	10	2	13	—
Dist. 3 total	**6,744**	**5,986**	**6,075**	**7,221**	**84.1**	**3,178**	**901**	**2,277**	**123**	**570**	**1,494**	**341**
Dist. 4 total	**450**	**412**	**422**	**527**	**80.1**	**211**	**91**	**120**	**11**	**20**	**107**	**9**
Dist. 5 total	**2,730**	**2,522**	**2,534**	**3,068**	**82.6**	**1,203**	**359**	**844**	**47**	**345**	**458**	**509**
November 28, 1986	**14,468**	**13,003**	**13,162**	**15,594**	**84.4**	**7,024**	**1,981**	**5,043**	**223**	**1,162**	**3,128**	**1,057**
November 21, 1986†	**14,547**	**12,965**	**13,123**	**15,594**	**84.2**	**7,118**	**1,983**	**5,135**	**201**	**1,148**	**2,961**	**910**
November 29, 1985	**13,949**	**12,379**	**12,539**	**15,638**	**80.2**	**6,496**	**2,269**	**4,227**	**195**	**1,010**	**3,261**	**963**

*Included in total motor gasoline. †Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API refinery report—December 19, 1986

District	Refinery operations (Thousands of barrels daily) Total refinery input	Crude runs	Input to crude stills	Operable capacity	% operated	Refinery output (Thousands of barrels daily) Motor gasoline Total	Leaded*	Unleaded*	Jet fuel Naphtha	Kero	Fuel oils Distillate	Residual
East coast	1,334	1,124	1,134	1,346	84.2	747	153	594	24	86	261	161
App. Dist. 1	103	93	94	108	87.0	29	8	21	—	—	27	11
Dist. 1 total	**1,437**	**1,217**	**1,228**	**1,454**	**84.5**	**776**	**161**	**615**	**24**	**86**	**288**	**172**
App. Dist. 2	68	64	64	66	97.0	31	11	20	—	3	16	2
Ind., Ill., Ky.	2,106	1,941	1,978	2,210	89.5	1,190	270	920	6	130	456	89
Minn., Wis., Dak.	305	294	294	322	91.3	143	43	100	3	9	77	14
Okla., Kan., Mo.	725	652	666	726	91.7	469	173	296	6	40	185	12
Dist. 2 total	**3,204**	**2,951**	**3,002**	**3,324**	**90.3**	**1,833**	**497**	**1,336**	**15**	**182**	**734**	**117**
Inland Texas	550	479	495	568	87.1	288	126	162	32	33	113	29
Texas Gulf coast	3,417	3,016	3,068	3,738	82.1	1,634	483	1,151	42	260	799	142
La. Gulf Coast	2,441	2,313	2,333	2,578	90.5	1,185	373	812	15	317	612	175
N. La. and Ark.	180	177	185	258	71.7	55	15	40	4	2	53	9
New Mexico	62	57	62	79	78.5	38	17	21	8	1	13	—
Dist. 3 total	**6,650**	**6,042**	**6,143**	**7,221**	**85.1**	**3,200**	**1,014**	**2,186**	**101**	**613**	**1,590**	**355**
Dist. 4 total	**454**	**436**	**440**	**527**	**83.5**	**239**	**93**	**146**	**12**	**33**	**96**	**12**
Dist. 5 total	**2,345**	**2,330**	**2,333**	**3,068**	**76.0**	**1,079**	**304**	**775**	**39**	**313**	**387**	**369**
December 19, 1986	**14,090**	**12,976**	**13,146**	**15,594**	**84.3**	**7,127**	**2,069**	**5,058**	**191**	**1,227**	**3,095**	**1,025**
December 12, 1986†	**13,826**	**12,742**	**12,907**	**15,594**	**82.8**	**6,786**	**1,914**	**4,872**	**214**	**1,152**	**2,908**	**1,007**
December 20, 1985	**13,981**	**12,608**	**12,790**	**15,638**	**81.8**	**6,591**	**2,125**	**4,466**	**190**	**1,007**	**3,035**	**981**

*Included in total motor gasoline. †Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	13,371	65,169	22,828	37,125	5,216	974	7,945	54,022	22,713	12,396
PAD II	72,773	65,027	26,204	31,972	6,851	977	8,387	38,220	3,755	15,553
PAD III	148,909	66,738	18,160	32,137	16,441	2,379	12,519	29,698	12,234	49,763
PAD IV	12,739	7,737	3,152	2,631	1,954	415	647	3,178	418	2,133
PAD I-IV	**247,792**	**204,671**	**70,344**	**103,865**	**30,462**	**4,745**	**29,498**	**125,118**	**39,120**	**79,845**
PAD V	77,220*	31,479	9,517	13,968	7,994	1,752	5,485	12,392	9,537	22,765
January 31, 1986	**325,012***	**236,150**	**79,861**	**117,833**	**38,456**	**6,497**	**34,983**	**137,510**	**48,657**	**102,610**
January 24, 1986§	**325,060**	**230,787**	**77,214**	**114,243**	**39,330**	**6,676**	**34,585**	**143,072**	**48,119**	**103,496**
February 1, 1985	**328,849**	**233,118**	**87,938**	**108,629**	**36,551**	**6,466**	**35,720**	**141,813**	**47,635**	**98,982**

*Includes 26,288 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised

Source: American Petroleum Institute

Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	13,975	71,681	23,684	43,351	4,646	1,367	8,260	39,216	17,618	10,661
PAD II	74,341	68,330	25,951	34,411	7,968	987	8,418	33,745	3,906	13,973
PAD III	146,506	65,989	18,475	32,376	15,138	2,313	12,697	26,103	10,854	50,488
PAD IV	13,633	8,193	2,900	2,674	2,619	538	830	2,919	363	1,978
PAD I-IV	**248,455**	**214,193**	**71,010**	**112,812**	**30,371**	**5,205**	**30,205**	**101,983**	**32,741**	**77,100**
PAD V	84,863*	30,291	9,731	12,994	7,566	1,687	5,934	12,598	9,118	24,524
February 28, 1986	**333,318***	**244,484**	**80,741**	**125,806**	**37,937**	**6,892**	**36,139**	**114,581**	**41,859**	**101,624**
February 21, 1986§	**329,460**	**241,614**	**79,937**	**121,787**	**39,890**	**6,822**	**36,800**	**122,691**	**45,040**	**103,654**
March 1, 1985	**320,166**	**227,278**	**83,476**	**107,092**	**36,710**	**5,958**	**34,755**	**123,402**	**47,079**	**98,422**

*Includes 27,958 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised

Source: American Petroleum Institute

Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	15,062	66,084	21,499	39,492	5,093	918	9,736	32,925	16,588	10,937
PAD II	76,192	65,634	24,226	34,165	7,243	994	10,069	28,110	3,498	14,663
PAD III	150,796	57,484	16,930	27,287	13,267	2,279	12,059	20,912	8,943	47,677
PAD IV	13,627	7,835	2,935	2,666	2,234	404	798	2,271	432	2,292
PAD I-IV	**255,677**	**197,037**	**65,590**	**103,610**	**27,837**	**4,595**	**32,662**	**84,218**	**29,461**	**75,569**
PAD V	86,928*	28,431	8,917	12,443	7,071	1,582	6,236	10,925	9,926	25,076
March 28, 1986	**342,605***	**225,468**	**74,507**	**116,053**	**34,908**	**6,177**	**38,898**	**95,143**	**39,387**	**100,645**
March 21, 1986§	**336,138**	**228,484**	**75,256**	**116,609**	**36,619**	**6,394**	**39,358**	**97,766**	**40,356**	**101,661**
March 29, 1985	**337,661**	**221,005**	**82,776**	**102,235**	**35,994**	**6,341**	**34,733**	**100,212**	**44,607**	**105,548**

*Includes 30,079 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised

Source: American Petroleum Institute

Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	16,619	59,538	18,861	36,538	4,139	1,394	10,180	32,069	14,608	11,768
PAD II	72,936	60,335	21,705	31,283	7,347	880	9,311	28,753	3,333	15,286
PAD III	151,753	54,897	14,288	27,127	13,482	1,973	14,636	24,052	10,014	50,510
PAD IV	12,651	7,226	2,770	2,407	2,049	349	858	2,652	383	2,683
PAD I-IV	**253,959**	**181,996**	**57,624**	**97,355**	**27,017**	**4,596**	**34,985**	**87,526**	**28,338**	**80,247**
PAD V	78,327*	26,793	8,071	12,219	6,503	1,637	6,343	9,739	9,257	25,503
April 25, 1986	**332,286***	**208,789**	**65,695**	**109,574**	**33,520**	**6,233**	**41,328**	**97,265**	**37,595**	**105,750**
April 18, 1986§	**340,149**	**209,544**	**64,835**	**110,494**	**34,215**	**6,334**	**39,670**	**95,591**	**37,555**	**104,227**
April 26, 1985	**342,075**	**213,662**	**78,743**	**101,490**	**33,429**	**6,459**	**35,289**	**96,301**	**46,031**	**112,454**

*Includes 25,469 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised

Source: American Petroleum Institute.

Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	16,333	64,230	20,144	40,266	3,820	1,009	9,502	30,004	15,544	12,980
PAD II	69,986	55,830	20,770	28,476	6,584	1,084	9,517	28,592	2,686	16,321
PAD III	144,618	64,607	18,248	31,143	15,216	2,595	12,404	25,965	8,165	53,966
PAD IV	11,803	6,492	2,218	2,250	2,024	378	746	2,950	675	2,603
PAD I-IV	**242,740**	**191,159**	**61,380**	**102,135**	**27,644**	**5,066**	**32,169**	**87,511**	**27,070**	**86,370**
PAD V	81,912*	27,671	8,259	12,748	6,664	1,312	5,399	10,264	9,888	26,956
May 30, 1986	**324,652***	**218,830**	**69,639**	**114,883**	**34,308**	**6,378**	**37,568**	**97,775**	**36,958**	**113,326**
May 23, 1986§	**327,946**	**212,461**	**67,234**	**111,141**	**34,086**	**5,484**	**38,124**	**93,201**	**35,270**	**114,508**
May 31, 1985	**355,607**	**215,039**	**75,943**	**104,770**	**34,326**	**6,716**	**34,484**	**104,596**	**43,135**	**113,229**

*Includes 33,355 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	17,283	65,486	20,093	41,377	4,016	958	10,057	34,207	15,005	13,315
PAD II	70,712	61,948	23,471	31,786	6,691	980	8,353	28,620	2,854	15,744
PAD III	151,514	64,644	17,973	31,207	15,464	2,041	14,250	27,910	10,125	53,873
PAD IV	10,689	6,310	2,368	2,044	1,898	348	921	3,013	393	2,288
PAD I-IV	**250,198**	**198,388**	**63,905**	**106,414**	**28,069**	**4,327**	**33,581**	**93,750**	**28,377**	**85,220**
PAD V	73,729*	29,213	8,555	13,384	7,274	1,469	5,734	10,797	9,591	26,872
June 27, 1986	**323,927***	**227,601**	**72,460**	**119,798**	**35,343**	**5,796**	**39,315**	**104,547**	**37,968**	**112,092**
June 20, 1986§	**322,228**	**228,927**	**73,847**	**119,745**	**35,335**	**5,910**	**39,595**	**103,661**	**37,513**	**112,957**
June 28, 1985	**343,036**	**216,902**	**81,489**	**101,560**	**33,853**	**6,632**	**35,998**	**108,762**	**41,344**	**116,069**

*Includes 27,148 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	16,645	64,985	20,240	39,637	5,108	1,089	10,228	40,024	17,397	12,703
PAD II	68,237	58,332	22,838	29,372	6,122	691	8,734	29,569	2,811	15,480
PAD III	157,603	63,450	17,018	30,996	15,436	2,195	15,963	27,433	10,910	51,278
PAD IV	11,050	6,502	2,543	2,386	1,573	334	938	3,268	412	2,300
PAD I-IV	**253,535**	**193,269**	**62,639**	**102,391**	**28,239**	**4,309**	**35,863**	**100,294**	**31,530**	**81,761**
PAD V	72,500*	29,118	7,701	13,801	7,616	1,992	6,061	9,589	8,957	26,000
July 25, 1986	**326,035***	**222,387**	**70,340**	**116,192**	**35,855**	**6,301**	**41,924**	**109,883**	**40,487**	**107,761**
July 18, 1986§	**327,768**	**226,283**	**73,095**	**117,740**	**35,448**	**6,015**	**42,202**	**110,501**	**39,992**	**109,379**
July 26, 1985	**326,244**	**226,892**	**80,101**	**111,496**	**35,295**	**6,523**	**36,590**	**118,740**	**41,976**	**114,821**

*Includes 21,492 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	17,413	63,451	19,980	38,748	4,723	945	11,324	54,234	17,778	11,071
PAD II	69,521	55,845	20,641	29,232	5,972	911	8,250	31,521	2,980	14,675
PAD III	155,748	64,315	18,392	30,524	15,399	2,077	16,425	32,243	11,054	48,697
PAD IV	11,140	6,016	2,399	2,105	1,512	288	898	2,933	367	2,003
PAD I-IV	**253,822**	**189,627**	**61,412**	**100,609**	**27,606**	**4,221**	**36,897**	**120,931**	**32,179**	**76,446**
PAD V	78,991*	27,222	7,482	12,470	7,270	1,976	5,856	9,458	9,065	24,218
August 29, 1986	**332,813***	**216,849**	**68,894**	**113,079**	**34,876**	**6,197**	**42,753**	**130,389**	**41,244**	**100,664**
August 22, 1986§	**330,269**	**214,828**	**66,377**	**112,448**	**36,003**	**6,623**	**41,416**	**126,672**	**39,643**	**104,017**
August 30, 1985	**322,398**	**225,719**	**80,695**	**110,225**	**34,799**	**6,871**	**35,330**	**115,213**	**38,570**	**104,247**

*Includes 32,423 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	15,308	67,232	19,281	43,176	4,775	924	10,613	64,626	20,049	11,453
PAD II	71,214	60,107	21,617	31,951	6,539	915	8,616	33,118	3,141	14,402
PAD III	166,388	69,865	17,583	34,711	17,571	2,175	17,533	35,871	11,133	47,312
PAD IV	10,840	6,085	2,311	2,173	1,601	343	834	3,013	421	2,042
PAD I-IV	**263,750**	**203,289**	**60,792**	**112,011**	**30,486**	**4,357**	**37,596**	**136,628**	**34,744**	**75,209**
PAD V	72,050*	31,114	8,577	14,613	7,924	1,753	6,073	10,853	8,989	26,654
September 26, 1986	**335,800***	**234,403**	**69,369**	**126,624**	**38,410**	**6,110**	**43,669**	**147,481**	**43,733**	**98,863**
September 19, 1986§	**328,387**	**231,522**	**71,236**	**123,479**	**36,807**	**5,815**	**43,749**	**144,497**	**41,283**	**99,211**
September 27, 1985	**314,243**	**224,960**	**78,082**	**111,084**	**35,794**	**6,389**	**36,553**	**117,063**	**42,998**	**102,832**

*Includes 26,862 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised.
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database.

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	15,689	68,665	18,536	44,591	5,538	1,168	11,250	69,900	23,406	12,215
PAD II	75,750	58,113	20,504	31,136	6,473	1,024	8,754	30,763	3,237	15,748
PAD III	163,092	63,382	16,082	30,963	16,337	2,557	16,161	35,145	10,956	48,331
PAD IV	11,700	5,741	2,033	2,100	1,608	345	857	2,881	379	2,349
PAD I-IV	**266,231**	**195,901**	**57,155**	**108,790**	**29,956**	**5,094**	**37,022**	**138,689**	**37,978**	**78,643**
PAD V	72,282*	30,305	7,795	14,520	7,990	1,844	6,173	11,379	8,848	23,019
October 24, 1986	**338,513***	**226,206**	**64,950**	**123,310**	**37,946**	**6,938**	**43,195**	**150,068**	**46,826**	**101,662**
October 17, 1986§	**340,361**	**226,190**	**65,078**	**123,733**	**37,379**	**6,839**	**42,963**	**151,215**	**45,512**	**98,849**
October 25, 1985	**322,078**	**214,184**	**72,375**	**107,568**	**34,241**	**6,504**	**36,064**	**122,237**	**47,422**	**108,201**

*Includes 25,159 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database.

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	14,657	65,976	17,912	42,998	5,066	1,047	10,835	66,480	21,680	12,507
PAD II	77,031	59,291	20,848	31,334	7,109	847	8,362	31,420	3,505	15,095
PAD III	164,897	63,954	15,404	32,035	16,515	2,672	15,999	35,421	11,741	50,710
PAD IV	11,434	6,138	2,202	2,121	1,815	409	640	2,788	397	2,095
PAD I-IV	**268,019**	**195,359**	**56,366**	**108,488**	**30,505**	**4,975**	**35,836**	**136,109**	**37,323**	**80,407**
PAD V	78,970*	29,148	7,712	14,193	7,243	1,865	6,039	11,411	9,137	21,079
November 28, 1986	**346,989***	**224,507**	**64,078**	**122,681**	**37,748**	**6,840**	**41,875**	**147,520**	**46,460**	**101,486**
November 21, 1986§	**343,885**	**223,317**	**63,882**	**122,738**	**36,697**	**6,730**	**41,447**	**150,187**	**46,191**	**102,881**
November 29, 1985	**314,775**	**213,426**	**72,775**	**106,294**	**34,357**	**6,248**	**38,022**	**135,856**	**46,885**	**109,605**

*Includes 26,644 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API crude and product stocks

(Thousands of barrels)

		Motor gasoline				Jet fuels		Fuel oils		
	Crude oil	Total	Leaded†	Unleaded†	Blending Comp.†	Naphtha	Kerosine	Distillate	Residual	Unfinished oils
PAD I	13,654	65,632	18,221	42,591	4,820	1,265	11,130	70,518	21,276	12,788
PAD II	77,592	61,491	21,057	32,641	7,793	862	8,629	34,269	2,907	14,262
PAD III	160,173	65,238	15,953	34,118	15,167	2,502	15,009	34,059	10,613	47,900
PAD IV	12,026	6,756	2,351	2,606	1,799	498	668	2,860	388	1,933
PAD I-IV	**263,445**	**199,117**	**57,582**	**111,956**	**29,579**	**5,127**	**35,436**	**141,806**	**35,184**	**76,883**
PAD V	77,853*	28,776	7,986	13,631	7,159	1,941	6,298	10,633	9,349	20,173
December 19, 1986	**341,298***	**227,893**	**65,586**	**126,587**	**36,738**	**7,068**	**41,734**	**152,439**	**44,533**	**97,056**
December 12, 1986§	**345,877**	**228,475**	**65,773**	**124,038**	**38,664**	**7,180**	**42,638**	**153,426**	**44,601**	**99,441**
December 20, 1985	**320,566**	**221,697**	**76,326**	**110,385**	**34,986**	**6,478**	**36,363**	**140,966**	**46,774**	**111,626**

*Includes 26,964 bbl. of Alaskan crude in transit by water. †Included in total motor gasoline. §Revised
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	1–31	1–24*	1–31	1–24*	1–31	1–24*	2–1
	1986	1986	1986	1986	1986	1986	1985
Total motor gasoline	582	97	22	36	604	133	418
Leaded gasoline†	185	1	—	—	185	1	257
Unleaded gasoline†	397	96	22	36	419	132	161
Mo. gas. blending comp.	4	—	—	—	4	—	—
Distillate§	342	361	13	10	355	371	174
Residual	520	388	9	12	529	400	600
Jet fuel-naphtha	—	34	—	—	—	34	—
Jet fuel-kerosine	36	36	—	—	36	36	54
LPG	225	202	8	5	233	207	229
Unfinished oils	119	148	—	1	119	149	89
Other	407	252	13	13	420	265	78
Total products	**2,235**	**1,518**	**65**	**77**	**2,300**	**1,595**	**1,642**
Canadian crude	429	368	42	1	471	369	206
Other foreign	2,904	2,943	84	23	2,988	2,966	2,660
Total crude	**3,333**	**3,311**	**126**	**24**	**3,459**	**3,335**	**2,866**
Total imports	**5,568**	**4,829**	**191**	**101**	**5,759**	**4,930**	**4,508**

*Revised. †Included in total motor gasoline. §Includes No. 4 fuel oil.
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	2-28	2-21*	2-28	2-21*	2-28	2-21*	3-1
	1986	1986	1986	1986	1986	1986	1985
Total motor gasoline	337	335	40	20	377	355	367
Leaded gasoline†	62	63	6	7	68	70	171
Unleaded gasoline†	275	272	34	13	309	285	196
Mo. gas. blending comp.	62	65	—	14	62	79	—
Distillate§	29	39	9	—	38	39	153
Residual	653	651	8	5	661	656	473
Jet fuel-naphtha	3	—	—	—	3	—	—
Jet fuel-kerosine	47	13	7	7	54	20	21
LPG	265	138	18	5	283	143	189
Unfinished oils	188	136	1	—	189	136	92
Other	226	285	15	11	241	296	128
Total products	**1,810**	**1,662**	**98**	**62**	**1,908**	**1,724**	**1,423**
Canadian crude	582	473	50	24	632	497	381
Other foreign	2,310	2,210	291	253	2,601	2,463	2,304
Total crude	**2,832**	**2,683**	**341**	**277**	**3,233**	**2,960**	**2,685**
Total imports	**4,702**	**4,345**	**439**	**339**	**5,141**	**4,684**	**4,108**

*Revised. †Included in total motor gasoline. §Includes No. 4 fuel oil.
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	3–28	3–21	3–28	3–21*	3–28	3–21*	3–29
	1986	1986	1986	1986	1986	1986	1985
Total motor gasoline	277	265	33	26	310	291	437
Leaded gasoline†	3	—	2	—	5	—	242
Unleaded gasoline†	274	265	31	26	305	291	195
Mo. gas. blending comp.	54	—	4	—	58	—	—
Distillate§	131	159	5	7	136	166	113
Residual	549	345	11	7	560	352	385
Jet fuel-naphtha	—	44	—	—	—	44	35
Jet fuel-kerosine	1	7	7	7	8	14	9
LPG	201	168	12	14	213	182	129
Unfinished oils	72	30	2	—	74	30	349
Other	337	361	21	17	358	378	341
Total products	**1,622**	**1,379**	**95**	**78**	**1.717**	**1,457**	**1,798**
Canadian crude	603	503	40	15	643	518	485
Other foreign	2,629	1,864	247	—	2,876	1,864	2,491
Total crude	**3,232**	**2,367**	**287**	**15**	**3,519**	**2,382**	**2,976**
Total imports	**4,854**	**3,746**	**382**	**93**	**5,236**	**3,839**	**4,774**

*Revised. †Included in total motor gasoline. §Includes No. 4 fuel oil
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	4-25	4-18*	4-25	4-18*	4-25	4-18*	4-26
	1986	1986	1986	1986	1986	1986	1985
Total motor gasoline	128	161	13	22	141	183	365
Leaded gasoline†	9	16	6	8	15	24	120
Unleaded gasoline†	119	145	7	14	126	159	245
Mo. gas. blending comp.	60	14	16	3	76	17	—
Distillate§	92	84	5	5	97	89	261
Residual	435	285	8	4	443	289	450
Jet fuel-naphtha	92	—	—	—	92	—	—
Jet fuel-kerosine	5	31	7	6	12	37	19
LPG	127	123	8	6	135	129	201
Unfinished oils	116	213	—	—	116	213	238
Other	299	198	—	18	299	216	180
Total products	**1,354**	**1,109**	**57**	**64**	**1,411**	**1,173**	**1,714**
Canadian crude	625	561	46	15	671	576	358
Other foreign	2,649	2,617	239	—	2,888	2,617	3,256
Total crude	**3,274**	**3,178**	**285**	**15**	**3,559**	**3,193**	**3,614**
Total imports	**4,628**	**4,287**	**342**	**79**	**4,970**	**4,366**	**5,328**

*Revised. †Included in total motor gasoline. §Includes No. 4 fuel oil
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	5-30	5-23*	5-30	5-23*	5-30	5-23*	5-31
	1986	1986	1986	1986	1986	1986	1985
Total motor gasoline	287	412	63	52	350	464	736
Leaded gasoline†	45	60	28	12	73	72	231
Unleaded gasoline†	242	352	35	40	277	392	505
Mo. gas. blending comp.	—	44	—	12	—	56	—
Distillate§	247	129	9	7	256	136	190
Residual	788	455	21	10	809	465	736
Jet fuel-naphtha	—	15	—	—	—	15	36
Jet fuel-kerosine	—	55	40	7	40	62	98
LPG	135	207	15	27	150	234	129
Unfinished oils	223	250	4	4	227	254	515
Other	312	131	15	23	327	154	190
Total products	**1,992**	**1,698**	**167**	**142**	**2,159**	**1,840**	**2,630**
Canadian crude	668	517	58	56	726	573	651
Other foreign	3,461	3,406	122	48	3,583	3,454	2,974
Total crude	**4,129**	**3,923**	**180**	**104**	**4,309**	**4,027**	**3,625**
Total imports	**6,121**	**5,621**	**347**	**246**	**6,468**	**5,867**	**6,255**

Revised. †Included in total motor gasoline. §Includes No. 4 fuel oil
ource: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	6-27	6-20*	6-27	6-20*	6-27	6-20*	6-28
	1986	1986	1986	1986	1986	1986	1985
Total motor gasoline	260	146	34	14	294	160	671
Leaded gasoline†	5	13	8	3	13	16	266
Unleaded gasoline†	255	133	26	11	281	144	405
Mo. gas. blending comp.	64	34	15	2	79	36	—
Distillate§	130	206	4	7	134	213	305
Residual	925	678	20	20	945	698	490
Jet fuel-naphtha	—	—	—	—	—	—	29
Jet fuel-kerosine	22	15	6	6	28	21	23
LPG	90	178	6	14	96	192	72
Unfinished oils	411	241	9	3	420	244	304
Other	108	395	—	13	108	408	222
Total products	**2,010**	**1,893**	**94**	**79**	**2,104**	**1,972**	**2,116**
Canadian crude	577	591	31	113	608	704	591
Other foreign	4,327	2,730	173	137	4,500	2,867	2,106
Total crude	**4,904**	**3,321**	**204**	**250**	**5,108**	**3,571**	**2,697**
Total imports	**6,914**	**5,214**	**298**	**329**	**7,212**	**5,543**	**4,813**

*Revised. †Included in total motor gasoline. §Includes No. 4 fuel oil
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	7-25 1986	7-18* 1986	7-25 1986	7-18* 1986	7-25 1986	7-18* 1986	7-26 1985
Total motor gasoline	442	328	92	49	534	377	419
Leaded gasoline†	20	148	6	11	26	159	163
Unleaded gasoline†	422	180	86	38	508	218	256
Mo. gas. blending comp.	10	4	—	—	10	4	—
Distillate§	201	381	10	9	211	390	74
Residual	985	569	19	15	1,004	584	549
Jet fuel-naphtha	29	46	15	3	44	49	7
Jet fuel-kerosine	33	31	—	7	33	38	—
LPG	128	178	6	11	134	189	163
Unfinished oils	194	392	6	10	200	402	237
Other	129	210	—	—	129	210	279
Total products	**2,151**	**2,139**	**148**	**104**	**2,299**	**2,243**	**1,728**
Canadian crude	484	665	41	2	525	667	488
Other foreign	3,612	3,343	—	289	3,612	3,632	2,418
Total crude	**4,096**	**4,008**	**41**	**291**	**4,137**	**4,299**	**2,906**
Total imports	**6,247**	**6,147**	**189**	**395**	**6,436**	**6,542**	**4,634**

*Revised †Included in total motor gasoline §Includes No. 4 fuel oil
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	8-29 1986	8-22* 1986	8-29 1986	8-22* 1986	8-29 1986	8-22* 1986	8-30 1985
Total motor gasoline	173	41	22	4	195	45	408
Leaded gasoline†	17	7	5	2	22	9	128
Unleaded gasoline†	156	34	17	2	173	36	280
Mo. gas. blending comp.	60	—	13	—	73	—	—
Distillate§	306	250	17	15	323	265	90
Residual	781	429	17	11	798	440	428
Jet fuel-naphtha	—	—	—	—	—	—	7
Jet fuel-kerosine	46	60	7	19	53	79	13
LPG	153	174	3	3	156	177	153
Unfinished oils	153	373	6	12	159	385	301
Other	157	367	8	11	165	378	346
Total products	**1,829**	**1,694**	**93**	**75**	**1,922**	**1,769**	**1,746**
Canadian crude	499	492	22	52	521	544	424
Other foreign	4,093	3,984	374	138	4,467	4,122	2,479
Total crude	**4,592**	**4,476**	**396**	**190**	**4,988**	**4,666**	**2,903**
Total imports	**6,421**	**6,170**	**489**	**265**	**6,910**	**6,435**	**4,649**

*Revised †Included in total motor gasoline §Includes No. 4 fuel oil
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	9-26 1986	9-19* 1986	9-26 1986	9-19* 1986	9-26 1986	9-19* 1986	9-27 1985
Total motor gasoline	295	121	38	14	333	135	200
Leaded gasoline†	48	21	12	4	60	25	63
Unleaded gasoline†	247	100	26	10	273	110	137
Mo. gas. blending comp.	45	42	20	18	65	60	—
Distillate§	172	381	4	14	176	395	174
Residual	457	592	13	15	470	607	529
Jet fuel-naphtha	36	—	—	—	36	—	11
Jet fuel-kerosine	50	95	26	13	76	108	44
LPG	154	186	7	6	161	192	69
Unfinished oils	265	129	8	5	273	134	107
Other	318	136	48	3	366	139	202
Total products	**1,792**	**1,682**	**164**	**88**	**1,956**	**1,770**	**1,336**
Canadian crude	461	568	17	58	478	626	423
Other foreign	4,974	3,745	149	152	5,123	3,897	2,871
Total crude	**5,435**	**4,313**	**166**	**210**	**5,601**	**4,523**	**3,294**
Total imports	**7,227**	**5,995**	**330**	**298**	**7,557**	**6,293**	**4,630**

*Revised †Included in total motor gasoline §Includes No. 4 fuel oil
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	10–24 1986	10–17* 1986	10–24 1986	10–17* 1986	10–24 1986	10–17* 1986	10–25 1985
Total motor gasoline	260	160	37	20	297	180	234
Leaded gasoline†	28	7	7	3	35	10	72
Unleaded gasoline†	232	153	30	17	262	170	162
Mo. gas. blending comp.	34	27	10	8	44	35	—
Distillate§	220	155	8	7	228	162	236
Residual	959	414	29	10	988	424	643
Jet fuel-naphtha	26	—	—	—	26	—	6
Jet fuel-kerosine	47	8	24	—	71	8	8
LPG	234	168	6	5	240	173	166
Unfinished oils	35	62	2	2	37	64	263
Other	262	269	56	3	318	272	218
Total products	**2,077**	**1,263**	**172**	**55**	**2,249**	**1,318**	**1,774**
Canadian crude	526	572	26	11	552	583	644
Other foreign	3,749	4,170	223	167	3,972	4,337	2,972
Total crude	**4,275**	**4,742**	**249**	**178**	**4,524**	**4,920**	**3,616**
Total imports	**6,352**	**6,005**	**421**	**233**	**6,773**	**6,238**	**5,390**

*Revised †Included in total motor gasoline §Includes No. 4 fuel oil
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	11-28 1986	11-21* 1986	11-28 1986	11-21* 1986	11–28 1986	11-21* 1986	11-29 1985
Total motor gasoline	101	364	16	41	117	405	393
Leaded gasoline†	—	44	—	10	—	54	80
Unleaded gasoline†	101	320	16	31	117	351	313
Mo. gas. blending comp.	66	56	16	18	82	74	—
Distillate§	291	170	5	13	296	183	321
Residual	524	668	34	40	558	708	714
Jet fuel-naphtha	8	8		—	8	8	—
Jet fuel-kerosine	78	51	41	37	119	88	56
LPG	267	423	8	11	275	434	151
Unfinished oils	98	188	2	4	100	192	415
Other	286	171	—	—	286	171	196
Total products	**1,719**	**2,099**	**122**	**164**	**1,841**	**2,263**	**2,246**
Canadian crude	508	581	35	—	543	581	452
Other foreign	2,834	3,746	14	341	2,848	4,087	2,052
Total crude	**3,342**	**4,327**	**49**	**341**	**3,391**	**4,668**	**2,504**
Total imports	**5,061**	**6,426**	**171**	**505**	**5,232**	**6,931**	**4,750**

*Revised †Included in total motor gasoline §Includes No. 4 fuel oil
Source: American Petroleum Institute
Data available in Oil & Gas Journal Energy Database

API imports of crude and products

(Thousands of barrels daily)

	Districts 1-4		District 5		Total U.S.		
	12–19 1986	12–12* 1986	12–19 1986	12–12* 1986	12–19 1986	12–12* 1986	12–20 1985
Total motor gasoline	254	274	30	33	284	307	388
Leaded gasoline†	71	3	8	1	79	4	117
Unleaded gasoline†	183	271	22	32	205	303	271
Mo. gas. blending comp.	51	68	15	15	66	83	—
Distillate§	511	65	12	1	523	66	451
Residual	820	746	39	36	859	782	824
Jet fuel-naphtha	8	—	—	—	8	—	—
Jet fuel-kerosine	19	48	1	5	20	53	26
LPG	253	171	5	6	258	177	180
Unfinished oils	98	120	2	1	100	121	440
Other	157	175	—	—	157	175	140
Total products	**2,171**	**1,667**	**104**	**97**	**2,275**	**1,764**	**2,449**
Canadian crude	553	567	—	13	553	580	512
Other foreign	3,544	4,404	56	58	3,660	4,462	2,797
Total crude	**4,097**	**4,971**	**56**	**71**	**4,153**	**5,042**	**3,309**
Total imports	**6,268**	**6,638**	**160**	**168**	**6,428**	**6,806**	**5,758**

*Revised †Included in total motor gasoline §Includes No. 4 fuel oil
Source: American Petroleum Institute
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